

**CONTRACT DOCUMENTS AND SPECIFICATIONS
FOR THE CONSTRUCTION OF
SHIPSHEWANA LAKE RESTORATION PROJECT:**

**Shipshewana Elementary School Constructed Wetlands
and Sara Davis Ditch Constructed Wetlands**

PREPARED FOR

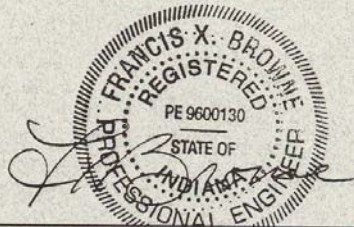
**SHIPSHEWANA COMMUNITY LAKE
IMPROVEMENT ASSOCIATION
LAGRANGE COUNTY, INDIANA**

March 1998

Property of
Lake and River Enhancement Section
Division of Fish and Wildlife/IDNR
402 W. Washington Street, W-273
Indianapolis, IN 46204

PREPARED BY:

**F. X. BROWNE, INC.
PO BOX 401
LANSDALE, PA 19446**



Frank X. Browne, PhD, PE

HUC 0405001120070

**CONTRACT DOCUMENTS AND SPECIFICATIONS
FOR THE CONSTRUCTION OF
SHIPSHEWANA LAKE RESTORATION PROJECT:**

**Shipshewana Elementary School Constructed Wetlands
and Sara Davis Ditch Constructed Wetlands**

**PREPARED FOR
SHIPSHEWANA COMMUNITY LAKE
IMPROVEMENT ASSOCIATION
LAGRANGE COUNTY, INDIANA**

January 1998

Prepared by:

**F. X. Browne, Inc.
PO Box 401
Lansdale, PA 19446**

FXB Project No. IN1337-02

SHIPSHEWANA LAKE RESTORATION PROJECT:
CONSTRUCTED WETLANDS

TABLE OF CONTENTS

<u>SECTION</u>	<u>TITLE</u>	<u>PAGES</u>
DIVISION 0 - BIDDING & CONTRACT REQUIREMENTS		
Doc. 1	Advertisement for Bids	1
Doc. 2	Information for Bidders	2
Doc. 3	Bid Form	3
Doc. 4	Bid Bond	2
Doc. 5	Agreement Between Owner and Contractor	2
Doc. 6	Payment Bond	2
Doc. 7	Performance Bond	2
Doc. 8	Notice of Award	1
Doc. 9	Notice to Proceed	1
Doc. 10	Change Order	1
CSC	Certificate of Substantial Completion	2
GC	General Conditions	11
SR	Special Requirements	4
DIVISION ONE - GENERAL REQUIREMENTS		
01010	Summary of Work	3
01035	Change Order Procedure	2
01045	Cutting and Patching	3
01050	Field Engineering	3
01210	Pre-Construction Conference	2
01220	Progress Meetings	2
01300	Submittals	6
01341	Manufacturer's Recommendations	2
01500	Temporary Facilities and Controls	5
01620	Product Delivery, Storage, & Protection	2
01700	Project Close-Out	2

SHIPSHEWANA LAKE RESTORATION PROJECT:
CONSTRUCTED WETLANDS

TABLE OF CONTENTS

<u>SECTION</u>	<u>TITLE</u>	<u>PAGES</u>
DIVISION TWO - SITE WORK		
02100	Site Preparation	4
02110	Erosion and Sediment Control	7
02200	Earthwork	14
02240	Ground Preparation for Wetland Planting	1
02270	Rip-Rap	2
02722	Storm Pipes	3
02830	Wetland Seeding	2
02850	Emergent Wetland Planting	2
02870	Aquatic Planting	2
DIVISION THREE - CONCRETE		
03100	Concrete Formwork	5
03200	Concrete Reinforcement	3
03300	Cast-in-Place Concrete	10

++ END OF TABLE OF CONTENTS ++

DIVISION 0

**BIDDING & CONTRACT
REQUIREMENTS**

ADVERTISEMENT FOR BIDS
SHIPSHEWANA COMMUNITY LAKE IMPROVEMENT ASSOCIATION
SHIPSHEWANA LAKE RESTORATION PROJECT:
CONSTRUCTED WETLANDS
LAGRANGE COUNTY, INDIANA

NOTICE IS HEREBY GIVEN that the Shipshewana Community Lake Association, Lagrange County, Indiana, hereinafter referred to as the OWNER, will receive sealed bids for the construction of the Shipshewana Lake Restoration Project: Constructed Wetlands.

Separate sealed BIDS for the construction of the Shipshewana Elementary School Wetlands and the Sara Davis Ditch Wetlands will be received by Shipshewana Community Lake Improvement Association, 3485 North 980 West, Shipshewana, Indiana 46565 until _____ PM, _____, 19_____, and then at said office publicly opened and read aloud. Bids received after such hours may be returned unopened.

The Project shall consist of, but is not limited to, earth-moving to create the ponds and wetlands as specified for each of the two sites, seeding and wetland vegetation, and all other work as described in the Specifications and shown on the Plans

The CONTRACT DOCUMENTS may be examined at the Shipshewana Community Lake Improvement Association, 3485 North 980 West, Shipshewana, Indiana 46565.

Copies of the CONTRACT DOCUMENTS may be obtained at the office of Shipshewana Community Lake Improvement Association located at 3485 North 980 West, Shipshewana, Indiana 46565 upon payment of a non-refundable fee of **\$ 15.00** for each set. Requests for Plans and Specification must include a return street address; post office boxes are not acceptable. Partial sets of plans and/or specifications are not available. Copies of any and all addenda which may be issued for this Project shall be included with the purchased documents or shall be forwarded to all plan and specification holders.

A conditional or qualified Bid will not be accepted.

Each Bidder is responsible for inspecting the Project site and for reading and being thoroughly familiar with the Contract Documents. The failure or omission of any Bidder to do any of the foregoing shall in no way relieve any Bidder from any obligation in respect to its Bid.

SHIPSHEWANA COMMUNITY LAKE
IMPROVEMENT ASSOCIATION
Michael Martin, President

INFORMATION FOR BIDDERS

BIDS will be received by Shipshewana Community Lake Improvement Association, herein called the OWNER, at 3485 North 980 West, Shipshewana, Indiana 46565 until _____, 19_____, and then at said office publicly opened and read aloud.

Each BID must be submitted in a sealed envelope, addressed to Shipshewana Community Lake Improvement Association at 3485 North 980 West, Shipshewana, Indiana 46565. Each sealed envelope containing a BID must be plainly marked on the outside as BID for the **Shipshewana Lake Restoration Project - Constructed Wetlands** and the envelope should bear on the outside the name of the BIDDER, his address, his license number if applicable, and the name of the project for which the BID is submitted. If forwarded by mail, the sealed envelope containing the BID must be enclosed in another envelope addressed to the OWNER at 3485 North 980 West, Shipshewana, Indiana 46565.

All BIDS must be made on the required BID form. All blank spaces for BID prices must be filled in, in ink or typewritten, and the BID form must be fully completed and executed when submitted. Only one copy of the BID form is required.

The OWNER may waive any informalities or minor defects or reject any and all BIDS. Any BID may be withdrawn prior to the above scheduled time for the opening of BIDS or authorized postponement thereof. Any BID received after the time and date specified shall not be considered. No BIDDER may withdraw a BID within 60 days after the actual date of the opening thereof. Should there be reasons why the contract cannot be awarded within the specified period, the time may be extended by mutual agreement between the OWNER and the BIDDER.

BIDDERS must satisfy themselves of the accuracy of the estimated quantities in the Bid Schedule by examination of the site and a review of the drawings and specifications including ADDENDA. After BIDS have been submitted, the BIDDER shall not assert that there was a misunderstanding concerning the quantities of WORK or of the nature of the WORK to be done.

The OWNER shall provide to BIDDERS prior to BIDDING, all information which is pertinent to, and delineates and describes, the land owned and rights-of-way acquired or to be acquired.

The CONTRACT DOCUMENTS contain the provisions required for the construction of the PROJECT. Information obtained from an officer, agent, or employee of the OWNER or any other person shall not affect the risks or obligations assumed by the CONTRACTOR or relieve him from fulfilling any of the conditions of the contract.

Each BID must be accompanied by a BID BOND payable to the OWNER for five percent of the total amount of the BID. As soon as the BID prices have been compared, the OWNER will return the BONDS of all except the three lowest responsible BIDDERS. When the Agreement is executed the bonds of the two remaining unsuccessful BIDDERS will be returned. The BID BOND of the successful BIDDER will be retained until the payment BOND and performance BOND have been executed and approved, after which it will be returned. A certified check may be used in lieu of a BID BOND.

A performance BOND and a payment BOND, each in the amount of 100 percent of the CONTRACT PRICE, with a corporate surety approved by the OWNER, will be required for the faithful performance of the contract.

The party to whom the contract is awarded will be required to execute the Agreement and obtain the performance BOND and payment BOND within ten (10) calendar days from the date when NOTICE OF AWARD is delivered to the BIDDER. The NOTICE OF AWARD shall be accompanied by the necessary Agreement and BOND forms. In case of failure of the BIDDER to execute the Agreement, the OWNER may at his option consider the BIDDER in default, in which case the BID BOND accompanying the proposal shall become the property of the OWNER.

The OWNER within ten (10) days of receipt of acceptable performance BOND, payment BOND and Agreement signed by the party to whom the Agreement was awarded shall sign the Agreement and return to such party an executed duplicate of the Agreement. Should the OWNER not execute the Agreement within such period, the BIDDER may by WRITTEN NOTICE withdraw his signed Agreement. Such notice of withdrawal shall be effective upon receipt of the notice by the OWNER.

The NOTICE TO PROCEED shall be issued within ten (10) days of the execution of the Agreement by the OWNER. Should there be reasons why the NOTICE TO PROCEED cannot be issued within such period, the time may be extended by mutual agreement between the OWNER and CONTRACTOR. If the NOTICE TO PROCEED has not been issued within the ten (10) day period or within the period mutually agreed upon, the CONTRACTOR may terminate the Agreement without further liability on the part of either party.

The OWNER may make such investigations as he deems necessary to determine the ability of the BIDDER to perform the WORK, and the BIDDER shall furnish to the OWNER all such information and data for this purpose as the OWNER may request. The OWNER reserves the right to reject any BID if the evidence submitted by, or investigation of, such BIDDER fails to satisfy the OWNER that such BIDDER is properly qualified to carry out the obligations of the Agreement and to complete the WORK contemplated therein.

A conditional or qualified BID will not be accepted.

All applicable laws, ordinances, and the rules and regulations of all authorities having jurisdiction over construction of the PROJECT shall apply to the contract throughout.

Each BIDDER is responsible for inspecting the site and for reading and being thoroughly familiar with the CONTRACT DOCUMENTS. The failure or omission of any BIDDER to do any of the foregoing shall in no way relieve any BIDDER from any obligation in respect to his BID.

Further, the BIDDER agrees to abide by the requirements under Executive Order No. 11246, as amended, including specifically the provisions of the equal opportunity clause set forth in the SUPPLEMENTAL GENERAL CONDITIONS.

The low BIDDER shall supply the names and addresses of major material SUPPLIERS and SUBCONTRACTORS when requested to do so by the OWNER.

BID

Proposal of _____ (hereinafter called
"BIDDER"), organized and existing under the laws of the State of _____
doing business as _____*.

To the Shipshewana Community Lake Improvement Association (hereinafter called "OWNER").

In compliance with your Advertisement for Bids, BIDDER hereby proposes to perform all WORK for the construction of the **Shipshewana Lake Restoration Project: Constructed Wetlands** in strict accordance with the CONTRACT DOCUMENTS, within the time set forth therein, and at the prices stated below.

By submission of this BID, each BIDDER certifies, and in the case of a joint BID each party thereto certifies as to his own organization, that this BID has been arrived at independently, without consultation, communication, or agreement as to any matter relating to this BID with any other BIDDER or with any competitor.

BIDDER hereby agrees to commence WORK under this contract on or before a date to be specified in the NOTICE TO PROCEED and to fully complete the PROJECT within **122** consecutive calendar days thereafter. BIDDER further agrees to pay as liquidated damages, the sum of **\$100** for each consecutive calendar day thereafter as provided in Section 15 of the General Conditions.

BIDDER acknowledges receipt of the following ADDENDA:

*Insert "a corporation", "a partnership", or "an individual" as applicable.

BID

BIDDER agrees to perform all the work described in the CONTRACT DOCUMENTS for the following unit prices or lump sum:

BID SCHEDULE

NOTE: BIDS shall include sales tax and all other applicable taxes and fees.

NO.	ITEM	UNIT	UNIT PRICE	AMOUNT	TOTAL PRICE
-----	------	------	------------	--------	-------------

BID

NO.	ITEM	UNIT	UNIT PRICE	AMOUNT	TOTAL PRICE
-----	------	------	------------	--------	-------------

TOTAL OF BID \$ _____

LUMP SUM PRICE (if applicable) \$ _____

Respectfully submitted:

Signature

Address

Title

Date

License Number (if applicable)

(SEAL-if BID is by a corporation)

Attest _____

BID BOND

KNOW ALL MEN BY THESE PRESENTS, that we, the undersigned, _____
_____ as Principal, and
_____ as Surety, are hereby
held and firmly bound unto _____ as OWNER
in the penal sum of _____
for the payment of which, well and truly to be made, we hereby jointly and severally bind ourselves,
successors and assigns.

Signed, this _____ day of _____, 19_____.

The Condition of the above obligation is such that whereas the Principal has submitted
to _____ a certain BID,
attached hereto and hereby made a part hereof to enter into a contract in writing, for the

NOW, THEREFORE,

- (a) If said BID shall be rejected, or
- (b) If said BID shall be accepted and the Principal shall execute and deliver a contract in the Form of Contract attached hereto (properly completed in accordance with said BID) and shall furnish a BOND for his faithful performance of said contract, and for the payment of all persons performing labor or furnishing materials in connection therewith, and shall in all other respects perform the agreement created by the acceptance of said BID,

then this obligation shall be void, otherwise the same shall remain in force and effect; it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall, in no event, exceed the penal amount of this obligation as herein stated.

The Surety, for value received, hereby stipulates and agrees that the obligations of said Surety and its BOND shall be in no way impaired or affected by any extension of the time within which the OWNER may accept such BID; and said Surety does hereby waive notice of any such extension.

IN WITNESS WHEREOF, the Principal and the Surety have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers, the day and year first set forth above.

Principal (L.S.)

Surety

By: _____

IMPORTANT-Surety companies executing BONDS must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the state where the project is located.

AGREEMENT

THIS AGREEMENT, made this _____ day of _____, 19 __, by and between the Shipshewana Community Lake Improvement Association, hereinafter called the "OWNER" and _____ doing business as (an individual,) or (a partnership,) or (a corporation) hereinafter called the "CONTRACTOR".

WITNESSETH: That for and in consideration of the payments and agreements hereinafter mentioned:

1. The CONTRACTOR will commence and complete the construction of the Shipshewana Lake Restoration Project: Constructed Wetlands, hereinafter called the "PROJECT". The project shall consist of, but is not limited to, earth-moving to create the ponds and wetlands as specified for each of the two sites, seeding and wetland vegetation, and all other work as described in the Specifications and shown on the Plans.
2. The CONTRACTOR will furnish all of the material, supplies, tools, equipment, labor and other services necessary for the construction and completion of the PROJECT described herein.
3. The CONTRACTOR will commence the work required by the CONTRACT DOCUMENTS within _____ calendar days after the date of the NOTICE TO PROCEED and will complete the same within _____ calendar days unless the period for completion is extended otherwise by the CONTRACT DOCUMENTS.
4. The CONTRACTOR agrees to perform all of the WORK described in the CONTRACT DOCUMENTS and comply with the terms therein for the sum of \$ _____, or as shown in the BID schedule.
5. The term "CONTRACT DOCUMENTS" means and includes the following:
 - (A) ADVERTISEMENT FOR BIDS
 - (B) INFORMATION FOR BIDDERS
 - (C) BID
 - (D) BID BOND
 - (E) AGREEMENT
 - (F) GENERAL CONDITIONS
 - (G) SUPPLEMENTAL GENERAL CONDITIONS
 - (H) PAYMENT BOND
 - (I) PERFORMANCE BOND
 - (J) NOTICE OF AWARD
 - (K) NOTICE TO PROCEED
 - (L) CHANGE ORDER

(M) DRAWINGS prepared by F.X. Browne, Inc., Lansdale, Pennsylvania; labeled Shipshewana Elementary School Constructed Wetlands 1 of 4 through 4 of 4 and Sara Davis Ditch Constructed Wetlands 1 of 4 through 4 of 4, and dated _____, 19_____

(N) SPECIFICATIONS prepared or issued by F.X. Browne, Inc., Lansdale, Pennsylvania; dated _____, 19_____

(O) ADDENDA:

No. _____, dated _____, 19_____

No. _____, dated _____, 19_____

No. _____, dated _____, 19_____

No. _____, dated _____, 19_____

6. The OWNER will pay to the CONTRACTOR in the manner and at such times as set forth in the General Conditions such amounts as required by the CONTRACT DOCUMENTS.

7. This Agreement shall be binding upon all parties hereto and their respective heirs, executors, administrators, successors, and assigns.

IN WITNESS WHEREOF, the parties hereto have executed, or caused to be executed by their duly authorized officials, this Agreement in (_____) each of which shall be deemed an original on the date first above written. (Number of Copies)

OWNER:

CONTRACTOR:

BY _____

BY _____

Name _____
(Please Type)

Name _____
(Please Type)

Title _____

Address _____

(SEAL)

ATTEST:

(SEAL)

ATTEST:

Name _____
(Please Type)

Name _____
(Please Type)

Title _____

PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS: that

(Name of Contractor)

(Address of Contractor)

a _____, hereinafter called Principal, and
(Corporation, Partnership or Individual)

(Name of Surety)

(Address of Surety)

hereinafter called Surety, are held and firmly bound unto _____

(Name of Owner)

(Address of Owner)

hereinafter called OWNER, in the penal sum of _____
_____ Dollars, \$(_____)

in lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that whereas, the Principal entered into a certain contract with the OWNER, dated the _____ day of _____ 19 _____, a copy of which is hereto attached and made a part hereof for the construction of:

SHIPSHEWANA LAKE RESTORATION PROJECT:

Shipshewana Elementary School Constructed Wetlands

Sara Davis Ditch Constructed Wetlands

NOW, THEREFORE, if the Principal shall promptly make payment to all persons, firms, SUBCONTRACTORS, and corporations furnishing materials for or performing labor in the prosecution of the WORK provided for in such contract, and any authorized extension or modification thereof, including all amounts due for materials, lubricants, oil, gasoline, coal and coke, repairs on machinery, equipment and tools, consumed or used in connection with the construction of such WORK, and all insurance premiums on said WORK, and for all labor, performed in such WORK whether by SUBCONTRACTOR or otherwise, then this obligation shall be void; otherwise to remain in full force and effect.

PROVIDED, FURTHER, that the said Surety for value received hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract or to the WORK to be performed thereunder or the SPECIFICATIONS accompanying the same shall in any wise affect its obligation on this BOND, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the contract or to the WORK or to the SPECIFICATIONS.

PROVIDED, FURTHER, that no final settlement between the OWNER and the CONTRACTOR shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

IN WITNESS WHEREOF, this instrument is executed in _____ counterparts, each one of which shall be deemed an original, this the _____ day of _____ 19_____.
(number)

ATTEST:

(Principal) Secretary

Principal

By _____ (s)

(SEAL)

(Witness as to Principal)

(ADDRESS)

(Address)

(Surety)

ATTEST:

(Surety) Secretary

(SEAL)

(Witness as to Surety)

By _____
ATTORNEY-in-Fact

(Address)

(Address)

NOTE: Date of BOND must not be prior to date of Contract.
If CONTRACTOR is Partnership, all partners should execute BOND.

IMPORTANT: Surety companies executing BONDS must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the State where the PROJECT is located.

PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS: that

(Name of Contractor)

(Address of Contractor)

a _____ hereinafter called Principal, and
(Corporation, Partnership, or Individual)

(Name of Surety)

(Address of Surety)

hereinafter called Surety, are held and firmly bound unto _____

(Name of Owner)

(Address of Owner)

hereinafter called OWNER, in the penal sum of _____

_____ Dollars, \$(_____)

in lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that whereas, the Principal entered into a certain contract with the OWNER, dated the _____ day of _____ 19_____, a copy of which is hereto attached and made a part hereof for the construction of:

SHIPSHEWANA LAKE RESTORATION PROJECT:

Shipshewana Elementary School Constructed Wetlands

Sara Davis Ditch Constructed Wetlands

NOW, THEREFORE, if the Principal shall well, truly and faithfully perform its duties, all the undertakings, covenants, terms, conditions, and agreements of said contract during the original term thereof, and any extensions thereof which may be granted by the OWNER, with or without notice to the Surety and during the one year guaranty period, and if he shall satisfy all claims and demands incurred under such contract, and shall fully indemnify and save harmless the OWNER from all costs and damages which it may suffer by reason of failure to do so, and shall reimburse and repay the OWNER all outlay and expense which the OWNER may incur in making good any default, then this obligation shall be void; otherwise to remain in full force and effect.

PROVIDED, FURTHER, that the said surety, for value received hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract or to WORK to be performed thereunder or the SPECIFICATIONS accompanying the same shall in any wise affect its

obligation on this BOND, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the contract or to the WORK or to the SPECIFICATIONS.

PROVIDED, FURTHER, that no final settlement between the OWNER and the CONTRACTOR shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

IN WITNESS WHEREOF, this instrument is executed in _____ counterparts, each one of which shall be deemed an original, this the _____ day of _____, 19____.

ATTEST:

(Principal) Secretary

By _____ (s)
Principal

(SEAL)

(Witness as to Principal)

(Address)

(Address)

(Surety)

ATTEST:

(Surety) Secretary

(SEAL)

By _____ (s)
ATTORNEY-in-Fact

(Witness as to Surety)

(Address)

(Address)

NOTE: Date of BOND must not be prior to date of Contract.
 If CONTRACTOR is Partnership, all partners should execute BOND.

IMPORTANT: Surety companies executing BONDS must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the state where the PROJECT is located.

NOTICE OF AWARD

To: _____

PROJECT Description:

SHIPSHEWANA LAKE RESTORATION PROJECT:

Shipshewana Elementary School Constructed Wetlands

Sara Davis Ditch Constructed Wetlands

The OWNER has considered the BID submitted by you for the above described WORK in response to its Advertisement for Bids dated _____, 19____, and Information for Bidders.

You are hereby notified that your BID has been accepted for items in the amount of
\$ _____.

You are required by the Information for Bidders to execute the Agreement and furnish the required CONTRACTOR'S Performance BOND, Payment BOND and certificates of insurance within ten (10) calendar days from the date of this Notice to you. If you fail to execute said Agreement and to furnish said BONDS within ten (10) days from the date of this Notice, said OWNER will be entitled to consider all your rights arising out of the OWNER'S acceptance of your BID as abandoned and as a forfeiture of your BID BOND. The OWNER will be entitled to such other rights as may be granted by law.

You are required to return an acknowledged copy of this NOTICE OF AWARD to the OWNER.

Dated this _____ day of _____, 19_____.

**SHIPSHEWANA COMMUNITY LAKE
IMPROVEMENT ASSOCIATION**

By _____

Title _____

ACCEPTANCE OF NOTICE

Receipt of the above NOTICE OF AWARD is hereby acknowledged

by _____,

this the _____ day of _____, 19_____

By _____

Title _____

NOTICE TO PROCEED

To: _____

PROJECT Description:

SHIPSHEWANA LAKE RESTORATION PROJECT:

Shipshewana Elementary School Constructed Wetlands

Sara Davis Ditch Constructed Wetlands

You are hereby notified to commence WORK in accordance with the Agreement dated _____, 19____, on or before _____, 19____, and you are to complete the WORK within _____ consecutive calendar days thereafter. The date of completion of all WORK is therefore _____, 19_____.

SHIPSHEWANA COMMUNITY LAKE IMPROVEMENT ASSOCIATION

By _____

Title _____

ACCEPTANCE OF NOTICE

Receipt of the above NOTICE TO PROCEED is hereby acknowledged

by _____,

this the _____ day of _____, 19_____

By _____

Title _____

CHANGE ORDER

Order No. _____

Date: _____

Agreement Date: _____

NAME OF PROJECT: _____

OWNER: _____

CONTRACTOR: _____

The following changes are hereby made to the CONTRACT DOCUMENTS:

Justification:

Change to CONTRACT PRICE:

Original CONTRACT PRICE \$ _____

Current CONTRACT PRICE adjusted by previous CHANGE ORDER \$ _____

The CONTRACT PRICE due to this CHANGE ORDER will be (increased) (decreased)

by: \$ _____

The new CONTRACT PRICE including this CHANGE ORDER will be \$ _____

Change to CONTRACT TIME:

The CONTRACT TIME will be (increased) (decreased) by _____ calendar days.

The date for completion of all work will be _____ (Date).

Approvals Required:

To be effective this Order must be approved by the Federal agency if it changes the scope or objective of the PROJECT, or as may otherwise be required by the SUPPLEMENTAL GENERAL CONDITIONS.

Requested by: _____

Recommended by: _____

Ordered by: _____

Accepted by: _____

Federal Agency Approval (where applicable) _____

CERTIFICATE OF SUBSTANTIAL COMPLETION

PROJECT

DATE OF ISSUANCE

OWNER

OWNER's Contract No.

CONTRACTOR ENGINEER

This Certificate of Substantial Completion applies to all Work under the Contract Documents or to the following specified parts thereof:

TO
OWNER

And To
CONTRACTOR

The Work to which this Certificate applies has been inspected by authorized representatives of OWNER, CONTRACTOR and ENGINEER, and that Work is hereby declared to be substantially complete in accordance with the Contract Documents on

.....
DATE OF SUBSTANTIAL COMPLETION

A tentative list of items to be completed or corrected is attached hereto. This list may not be all-inclusive, and the failure to include an item in it does not alter the responsibility of CONTRACTOR to complete all the Work in accordance with the Contract Documents. The items in the tentative list shall be completed or corrected by CONTRACTOR within _____ days of the above date of Substantial Completion.

EJCDC No. 1910-8-D (1990 Edition)

Prepared by the Engineers Joint Contract Documents Committee and endorsed by The Associated General Contractors of America.

From the date of Substantial Completion the responsibilities between OWNER and CONTRACTOR for security, operation, safety, maintenance, heat, utilities, insurance and warranties and guarantees shall be as follows:

RESPONSIBILITIES:

OWNER: _____

CONTRACTOR: _____

The following documents are attached to and made a part of this Certificate:

[For items to be attached see definition of Substantial Completion as supplemented and other specifically noted conditions precedent to achieving Substantial Completion as required by Contract Documents.]

This certificate does not constitute an acceptance of Work not in accordance with the Contract Documents nor is it a release of CONTRACTOR's obligation to complete the Work in accordance with the Contract Documents.

Executed by ENGINEER on _____, 19

.....
ENGINEER

By:
(Authorized Signature)

CONTRACTOR accepts this Certificate of Substantial Completion on _____, 19

.....
CONTRACTOR

By:

OWNER accepts this Certificate of Substantial Completion on _____, 19

.....
OWNER

By:
(Authorized Signature)

GENERAL CONDITIONS

1. Definitions
2. Additional Instructions and Detail Drawings
3. Schedules, Reports and Records
4. Drawings and Specifications
5. Shop Drawings
6. Materials, Services and Facilities
7. Inspection and Testing
8. Substitutions
9. Patents
10. Surveys, Permits, Regulations
11. Protection of Work, Property, Persons
12. Supervision by Contractor
13. Changes in the Work
14. Changes in Contract Price
15. Time for Completion and Liquidated Damages
16. Correction of Work
17. Subsurface Conditions
18. Suspension of Work, Termination and Delay
19. Payments to Contractor
20. Acceptance of Final Payment as Release
21. Insurance
22. Contract Security
23. Assignments
24. Indemnification
25. Separate Contracts
26. Subcontracting
27. Engineer's Authority
28. Land and Rights-of-Way
29. Guaranty
30. Arbitration
31. Taxes

1. **DEFINITIONS**

1.1 Wherever used in the CONTRACT DOCUMENTS the following terms shall have the meanings indicated which shall be applicable to both the singular and plural thereof:

1.2 **ADDENDA** - Written or graphic instruments issued prior to the execution of the Agreement which modify or interpret the CONTRACT DOCUMENTS, DRAWINGS and

SPECIFICATIONS, by additions, deletions, clarifications or corrections.

1.3 **BID** - The offer or proposal of the BIDDER submitted on the prescribed form setting forth the prices for the WORK to be performed.

1.4 **BIDDER** - Any person, firm or corporation submitting a BID for the WORK.

1.5 **BONDS** - Bid, Performance, and Payment Bonds and other instruments of security, furnished by the CONTRACTOR and his surety in accordance with the CONTRACT DOCUMENTS,

1.6 **CHANGE ORDER** - A written order to the CONTRACTOR authorizing an addition, deletion or revision in the WORK within the general scope of the CONTRACT DOCUMENTS, or authorizing an adjustment in the CONTRACT PRICE or CONTRACT TIME.

1.7 **CONTRACT DOCUMENTS** - The contract, including Advertisement For Bids, Information For Bidders, BID, Bid Bond, Agreement, Payment Bond, Performance Bond, NOTICE OF AWARD, NOTICE TO PROCEED, CHANGE ORDER, DRAWINGS, SPECIFICATIONS, and ADDENDA.

1.8 **CONTRACT PRICE** - The total monies payable to the CONTRACTOR under the terms and conditions of the CONTRACT DOCUMENTS.

1.9 **CONTRACT TIME** - The number of calendar days stated in the CONTRACT DOCUMENTS for the completion of the WORK.

1.10 **CONTRACTOR** - The person, firm or corporation with whom the OWNER has executed the Agreement.

1.11 **DRAWINGS** - The part of the CONTRACT DOCUMENTS which show the characteristics and scope of the WORK to be performed and which have been prepared or approved by the ENGINEER.

1.12 **ENGINEER** - The person, firm or corporation named as such in the CONTRACT DOCUMENTS.

1.13 **FIELD ORDER** - A written order effecting a change in the WORK not involving an adjustment in the CONTRACT PRICE or an extension of the CONTRACT TIME, issued by the ENGINEER to the CONTRACTOR during construction.

1.14 **NOTICE OF AWARD** - The written notice of the acceptance of the BID from the OWNER to the successful BIDDER.

1.15 **NOTICE TO PROCEED** - Written communication issued by the OWNER to the CONTRACTOR authorizing him

GENERAL CONDITIONS

to proceed with the WORK and establishing the date of commencement of the WORK.

1.16 OWNER - A public or quasi-public body or authority, corporation, association, partnership, or individual for whom the WORK is to be performed.

1.17 PROJECT - The undertaking to be performed as provided in the CONTRACT DOCUMENTS.

1.18 RESIDENT PROJECT REPRESENTATIVE - The authorized representative of the OWNER who is assigned to the PROJECT site or any part thereof.

1.19 SHOP DRAWINGS - All drawings, diagrams, illustrations, brochures, schedules and other data which are prepared by the CONTRACTOR, a SUBCONTRACTOR, manufacturer, SUPPLIER or distributor, which illustrate how specific portions of the WORK shall be fabricated or installed.

1.20 SPECIFICATIONS - A part of the CONTRACT DOCUMENTS consisting of written descriptions of a technical nature of materials, equipment, construction systems, standards and workmanship.

1.21 SUBCONTRACTOR - An individual, firm or corporation having a direct contract with the CONTRACTOR or with any other SUBCONTRACTOR for the performance of a part of the WORK at the site.

1.22 SUBSTANTIAL COMPLETION - That date as certified by the ENGINEER when the construction of the PROJECT or a specified part thereof is sufficiently completed, in accordance with the CONTRACT DOCUMENTS, so that the PROJECT or specified part can be utilized for the purposes for which it is intended.

1.23 SUPPLEMENTAL GENERAL CONDITIONS - Modifications to General Conditions required by a Federal agency for participation in the PROJECT and approved by the agency in writing prior to inclusion in the CONTRACT DOCUMENTS, or such requirements that may be imposed by applicable state laws.

1.24 SUPPLIER - Any person or organization who supplies materials or equipment for the WORK, including that fabricated to a special design, but who does not perform labor at the site.

1.25 WORK - All labor necessary to produce the construction required by the CONTRACT DOCUMENTS, and all materials and equipment incorporated or to be incorporated in the PROJECT.

1.26 WRITTEN NOTICE - Any notice to any party of the Agreement relative to any part of this Agreement in writing and considered delivered and the service thereof completed,

when posted by certified or registered mail to the said party at his last given address, or delivered in person to said party or his authorized representative on the WORK.

2. ADDITIONAL INSTRUCTIONS AND DETAIL DRAWING

2.1 The CONTRACTOR may be furnished additional instructions and detail drawings, by the ENGINEER, as necessary to carry out the WORK required by the CONTRACT DOCUMENTS.

2.2 The additional drawings and instruction thus Supplied will become a part of the CONTRACT DOCUMENTS. The CONTRACTOR shall carry out the WORK in accordance with the additional detail drawings and instructions.

3. SCHEDULES, REPORTS AND RECORDS

3.1 The CONTRACTOR shall submit to the OWNER such schedule of quantities and costs, progress schedules, payrolls, reports, estimates, records and other data where applicable as are required by the CONTRACT DOCUMENTS for the WORK to be performed.

3.2 Prior to the first partial payment estimate the CONTRACTOR shall submit construction progress schedules showing the order in which he proposes to carry on the WORK, including dates at which he will start the various parts of the WORK, estimated date of completion of each part and, as applicable:

3.2.1. The dates at which special detail drawings will be required; and

3.2.2. Respective dates for submission of SHOP DRAWINGS, the beginning of manufacture, the testing and the installation of materials, supplies and equipment.

3.3 The CONTRACTOR shall also submit a schedule of payments that he anticipates he will earn during the course of the WORK.

4. DRAWINGS AND SPECIFICATIONS

4.1 The intent of the DRAWINGS and SPECIFICATIONS is that the CONTRACTOR shall furnish all labor, materials, tools, equipment, and transportation necessary for the proper execution of the WORK in accordance with the CONTRACT DOCUMENTS and all incidental work necessary to complete the PROJECT in an acceptable manner, ready for use, occupancy or operation by the OWNER.

4.2 In case of conflict between the DRAWINGS and SPECIFICATIONS, the SPECIFICATIONS shall govern. Figure dimensions on DRAWINGS shall govern over scale

GENERAL CONDITIONS

dimensions, and detailed DRAWINGS shall govern over general DRAWINGS.

4.3 Any discrepancies found between the DRAWING and SPECIFICATIONS and site conditions or any inconsistencies or ambiguities in the DRAWINGS or SPECIFICATIONS shall be immediately reported to the ENGINEER, in writing, who shall promptly correct such inconsistencies or ambiguities in writing. WORK done by the CONTRACTOR after his discovery of such discrepancies, inconsistencies or ambiguities shall be done at the CONTRACTOR'S risk.

5. SHOP DRAWINGS

5.1 The CONTRACTOR shall provide SHOP DRAWINGS as may be necessary for the prosecution of them WORK as required by the CONTRACT DOCUMENTS. The ENGINEER shall promptly review all SHOP DRAWINGS. The ENGINEER'S approval of any SHOP DRAWING shall not release the CONTRACTOR from responsibility for deviations from the CONTRACT DOCUMENTS. The approval of any SHOP DRAWING which substantially deviates from the requirement of the CONTRACT DOCUMENTS shall be evidenced by a CHANGE ORDER.

5.2 When submitted for the ENGINEER'S review, SHOP DRAWINGS shall bear the CONTRACTOR'S certification that he has reviewed, checked and approved the SHOP DRAWINGS and that they are in conformance with the requirements of the CONTRACT DOCUMENTS.

5.3 Portions of the WORK requiring a SHOP DRAWING or sample submission shall not begin until the SHOP DRAWING or submission has been approved by the ENGINEER. A copy of each approved SHOP DRAWING and each approved sample shall be kept in good order by the CONTRACTOR at the site and shall be available to the ENGINEER.

6. MATERIALS, SERVICES AND FACILITIES

6.1 It is understood that, except as otherwise specifically stated in the CONTRACT DOCUMENTS, the CONTRACTOR shall provide and pay for all materials, labor, tools, equipment, water, light, power, transportation, supervision, temporary construction of any nature, and all other services and facilities of any nature whatsoever necessary to execute, complete, and deliver the WORK within the specified time.

6.2 Materials and equipment shall be so stored as to insure the preservation of their quality and fitness for the WORK. Stored materials and equipment to be incorporated in the WORK shall be located so as to facilitate prompt inspection.

6.3 Manufactured articles, materials and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned as directed by the manufacturer.

6.4 Materials, supplies and equipment shall be in accordance with samples submitted by the CONTRACTOR and approved by the ENGINEER.

6.5 Materials, SUPPLIES or its or equipment to be incorporated into the WORK shall not be purchased by the CONTRACTOR or the SUBCONTRACTOR subject to a chattel mortgage or under a conditional sale contract or other agreement by which an interest is retained seller.

7. INSPECTION AND TESTING

7.1 All materials and equipment used in the construction of the PROJECT shall be subject to adequate inspection and testing in accordance with general accepted standards, as required and defined in the CONTRACT DOCUMENTS.

7.2 The OWNER shall provide all inspection and testing services not required by the CONTRACT DOCUMENTS.

7.3 The CONTRACTOR shall provide at his expense the testing and inspection services required by the CONTRACT DOCUMENTS.

7.4 If the CONTRACT DOCUMENTS, laws, ordinances, rules, regulations or orders of any public authority having jurisdiction require any WORK Specifically be inspected, tested, or approved by someone other than the CONTRACTOR, the CONTRACTOR will give the ENGINEER timely notice of readiness. The CONTRACTOR will then furnish the ENGINEER the required certificates of inspection, testing or approval.

7.5 Inspections, tests or approvals by the engineer or others shall not relieve the CONTRACTOR from his obligations to perform the WORK in accordance with the requirements of the CONTRACT DOCUMENTS.

7.6 The ENGINEER and his representatives will at all times have access to the WORK. In addition authorized representatives and agents of any participating Federal or state agency shall be permitted to inspect all work, materials, payrolls, records of personnel, invoices of materials, and other relevant data and records. The CONTRACTOR will provide proper facilities for such access and observation of the WORK and also for any inspection, or testing thereof.

7.7 If any WORK is covered contrary, to the written instructions of the ENGINEER it must, if requested by the ENGINEER, be uncovered for his observation and replaced at the CONTRACTOR'S expense.

7.8 If the ENGINEER considers it necessary or advisable that covered WORK be inspected or tested others, the

GENERAL CONDITIONS

CONTRACTOR, at the ENGINEER'S request will uncover, expose or otherwise make available observation, inspection or testing as the ENGINE may require, that portion of the WORK in question furnishing all necessary labor, materials, tools, a equipment. If it is found that such WORK is defective the CONTRACTOR will bear all the expenses of so uncovering, exposure, observation, inspection a testing and of satisfactory reconstruction. If, however such WORK is not found to be defective, the CONTRACTOR will be allowed an increase in the CONTRACT PRICE or an extension of the CONTRACT TIME, or both, directly attributable to such uncovering, exposure, observation, inspection, testing and reconstruction and an appropriate CHANGE ORDER shall be issued.

8. *SUBSTITUTIONS*

8.1 Whenever a material, article or piece of equipment is identified on the DRAWINGS or SPECIFICATIONS by reference to brand name or catalogue number, it shall be understood that this is referenced for the purpose of defining the performance or other salient requirements and that other products of equal capacities, quality and function shall be considered. The CONTRACTOR may recommend the Substitution of a material, article, or piece of equipment of equal substance and function for those referred to in the CONTRACT DOCUMENTS by reference to brand name or catalogue number, and if, in the opinion of the ENGINEER, such material, article, or piece of equipment is of equal substance and function to this specified, the ENGINEER may approve its substitution and use by the CONTRACTOR. Any cost differential shall be deductible from the CONTRACT PRICE and the CONTRACT DOCUMENTS shall be appropriately modified by CHANGE ORDER. The CONTRACTOR warrants that if substitutes are approved, no major changes in the function or general design of the PROJECT will result. Incidental changes or extra component parts required to accommodate the substitute will be made by the CONTRACTOR without a change in the CONTRACT PRICE or CONTRACT TIME.

9. *PATENTS*

9.1 The CONTRACTOR shall pay all applicable royalties and license fees. He shall defend all suits or claims of infringement of any patent right and save the OWNER harmless from loss on account thereof, except that the OWNER shall be responsible for any such loss when a particular process, design, or the product of a particular manufacturer or manufacturers is specified, however, if the CONTRACTOR has reason to believe that the design, process or product specified is an infringement of a patent, he shall be responsible for such loss unless he promptly gives such information to the Engineer.

10 *SURVEYS, PERMITS, REGULATIONS*

10.1 The OWNER shall furnish all boundary surveys and establish all base lines for locating the principal component parts of the WORK together with a suitable number of bench marks adjacent to the WORK as shown in the CONTRACT DOCUMENTS. From the information provided by the OWNER, unless otherwise specified in the CONTRACT DOCUMENTS, the CONTRACTOR shall develop and make all detail surveys needed for construction such as slope stakes, batter boards, stake for pile locations and other working points, lines, elevations and cut sheets.

10.2 The CONTRACTOR shall carefully preserve bench marks, reference points and stakes and, in case of willful or careless destruction, he shall be charged with the resulting expense and shall be responsible for any mistakes that may be caused by their unnecessary loss or disturbance.

10.3 Permits and licenses of a temporary nature necessary for the prosecution of the WORK shall be secured and paid for by the CONTRACTOR unless otherwise stated in the SUPPLEMENTAL GENERAL CONDITIONS. Permits, licenses and easements for permanent structures or permanent changes in existing facilities shall be secured and paid for by the OWNER, unless otherwise specified. The CONTRACTOR shall give all notices and comply with all laws, ordinances, rules and regulations bearing on the conduct of the WORK as drawn and specified. If the CONTRACTOR observes that the CONTRACT DOCUMENTS are at variance therewith, he shall promptly notify the ENGINEER in writing, and any necessary changes shall be adjusted as provided in Section 13, CHANGES IN THE WORK changes in the WORK or deviations from the CONTRACT DOCUMENTS caused thereby, and a CHANGE ORDER shall thereupon be issued covering the changes and deviations involved.

11 *PROTECTION OF WORK, PROPERTY AND PERSONS*

11.1 The CONTRACTOR will be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the WORK. He will take all necessary precautions for the safety of, and will provide the necessary protection to prevent damage, injury or loss to all employees on the WORK and other persons who may be affected thereby, all the WORK and all materials or equipment to be incorporated therein, whether in storage on or off the site, and other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction.

11.2 The CONTRACTOR will comply with all applicable laws, ordinances, rules, regulations and orders of any public body having jurisdiction. He will erect and maintain, as required by the conditions and progress of the WORK, all necessary safeguards for safety and protection. He will notify owners of adjacent utilities when prosecution of the WORK may affect them. The CONTRACTOR will remedy all

GENERAL CONDITIONS

damage, injury or loss to any property caused, directly or indirectly, in whole or in part, by the CONTRACTOR, and SUBCONTRACTOR or anyone directly or indirectly employed by any of them or anyone for whose acts any of them be liable, except damage or loss attributable to the fault of the CONTRACT DOCUMENTS or to the acts or omissions of the OWNER or the ENGINEER or anyone employed by either of them or anyone for whose acts either of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of the CONTRACTOR.

11.3 In emergencies affecting the safety or persons or the WORK or property at he site or adjacent thereto, the CONTRACTOR, without special instruction or authorization from the ENGINEER or OWNER, shall act to prevent threatened damage, injury or loss. He will give the ENGINEER prompt WRITTEN NOTICE of any insignificant changes in the WORK or deviations from the CONTRACT DOCUMENTS caused thereby, and a CHANGE ORDER shall thereupon be issued covering the changes and deviations involved.

12. SUPERVISION BY CONTRACTOR

12.1 The CONTRACTOR will supervise and direct the WORK. He will be solely responsible for the means, methods, techniques, sequences and procedures of construction. The CONTRACTOR will employ and maintain on the WORK a qualified supervisor or superintendent who shall have been designated in writing by the CONTRACTOR as the CONTRACTOR'S representative at the site. The supervisor shall have full authority to act on behalf of the CONTRACTOR and all communications given to the supervisor shall be its as binding as if given to the CONTRACTOR. The Supervisor shall be present on the site at all times as required to perform adequate supervision and coordination of the WORK.

13. CHANGES IN THE WORK

13.1 The OWNER may at any time, as the need arises, order changes within the scope of the WORK without invalidating the Agreement. If such changes increase or decrease the amount due under the CONTRACT DOCUMENTS, or in the time required for performance of the WORK, an equitable adjustment shall be authorized by CHANGE ORDER.

13.2 The ENGINEER, also, may at any time, by issuing a FIELD ORDER, make changes in the details of the WORK. The CONTRACTOR shall proceed with the performance of any changes in the WORK so ordered by the ENGINEER unless the CONTRACTOR believes that such FIELD ORDER entitles him to a change in CONTRACT PRICE or TIME, or both, in which event he shall give the ENGINEER WRITTEN NOTICE thereof within seven (7) days after the receipt of the ordered change. Thereafter the

CONTRACTOR shall document the basis - for the change in CONTRACT PRICE or TIME within thirty (30) days. The CONTRACTOR shall not execute such changes pending the receipt of an executed CHANGE ORDER or further instruction from the OWNER.

14. CHANGES IN CONTRACT PRICE

14.1 The CONTRACT PRICE may be changed only by a CHANGE ORDER. The value of any WORK covered by a CHANGE ORDER or of any claim for increase or decrease in the CONTRACT PRICE shall be determined by one or more of the following methods in the order of precedence listed below:

- (a) Unit prices previously approved.
- (b) An agreed lump sum.
- (c) The actual cost for labor, direct overhead, materials supplies, equipment, and other services necessary to complete the work. In addition there shall be added an amount to be agreed upon but not to exceed fifteen (15) percent of the actual cost of the WORK to cover the cost of general overhead and profit.

15. TIME FOR COMPLETION AND LIQUIDATED DAMAGES

15.1 The date of beginning and the time for completion of the WORK are essential conditions of the CONTRACT DOCUMENTS and the WORK embraced shall be commenced on a date specified in the NOTICE TO PROCEED.

15.2 The CONTRACTOR will proceed with the WORK at such rate of progress to insure full completion within the CONTRACT TIME. It is expressly understood and agreed, by and between the CONTRACTOR and the OWNER, that the CONTRACT time for the completion of the WORK described herein is a reasonable time, taking into consideration the average climatic and economic conditions and other factors prevailing in the locality of the WORK.

15.3 If the CONTRACTOR shall fail to complete the WORK within the CONTRACT TIME, or extension of time granted by the OWNER, then the CONTRACTOR will pay to the OWNER the amount for liquidated damages as specified in the BID for each calendar day that the CONTRACTOR shall be in default after the time stipulated in the CONTRACT DOCUMENTS.

15.4 The CONTRACTOR shall not be charged with liquidated damages or any excess cost when the delay in completion of the WORK is due to the following, and the CONTRACT has promptly given WRITTEN NOTICE of such delay to the OWNER or ENGINEER.

- 15.4.1 To any preference, priority or allocation order duly issued by the OWNER.

GENERAL CONDITIONS

15.4.2 To unforeseeable causes beyond the control and without the fault or negligence of the CONTRACTOR, including but not restricted to, acts of God, or of the public enemy, acts of the OWNER, acts of another CONTRACTOR in the performance of a contract with the OWNER, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes, and abnormal and unforeseeable weather; and

15.4.3 To any delays of SUBCONTRACTORS occasioned by any of the causes specified in paragraphs 15.4.1 and 15.4.2 of this article.

16. CORRECTION OF WORK

16.1 The CONTRACTOR shall promptly remove from the premises all WORK rejected by the ENGINEER for failure to comply with the CONTRACTOR DOCUMENTS, whether incorporated in the construction or not, and the CONTRACTOR shall promptly replace and re-execute the WORK in accordance with the CONTRACT DOCUMENTS and without expense to the OWNER and shall bear the expense of making good all WORK of other CONTRACTORS destroyed or damaged by such removal or replacement.

16.2 All removal and replacement WORK shall be done at the CONTRACTOR'S expense. If the CONTRACTOR does not take action to remove such rejected WORK within ten (10) days after receipt of WRITTEN NOTICE, the OWNER may remove such WORK and store the materials at the expense of the CONTRACTOR.

17. SUBSURFACE CONDITIONS

17.1 The CONTRACTOR shall promptly, and before such conditions are disturbed, except in the event of an emergency, notify the OWNER by WRITTEN NOTICE of:

17.1.1 Subsurface or latent physical conditions at the site differing materially from those indicated in the CONTRACT DOCUMENTS; or

17.1.2 Unknown physical conditions at the site, of an unusual nature, differing materially from those ordinarily, encountered and generally recognized as inherent in WORK of the character provided for in the CONTRACT DOCUMENTS.

17.2 The OWNER shall promptly investigate the conditions, and if he finds that such conditions do so materially differ and cause an increase or decrease in the cost of, or in the time required for, performance of the WORK, an equitable adjustment shall be made and the CONTRACT DOCUMENTS shall be modified by a CHANGE ORDER. Any claim of the CONTRACTOR for adjustment hereunder shall not be allowed unless he has

given the required WRITTEN NOTICE; provided that the OWNER may, if he determines the facts so justify, consider and adjust any such claims asserted before the date of final payment.

18. SUSPENSION OF WORK, TERMINATION AND DELAY

18.1 The OWNER may suspend the WORK or any portion thereof for a period of not more than ninety days or such further time as agreed upon by the CONTRACTOR, by WRITTEN NOTICE to the CONTRACTOR and the ENGINEER which notice shall fix the date on which WORK shall be resumed. The CONTRACTOR will resume that WORK on the date so fixed. The CONTRACTOR will be allowed an increase in the CONTRACT PRICE or an extension of the CONTRACT TIME, or both, directly attributable to any suspension.

18.2 If the CONTRACTOR is adjudged a bankrupt or insolvent, or if he makes a general assignment for the benefit of his creditors, or if a trustee or receiver is appointed for the CONTRACTOR or for any of his property, or if he files a petition to take advantage of any debtor's act, or to reorganize under the bankruptcy or applicable laws, or if he repeatedly fails to supply sufficient skilled workmen or suitable materials or equipment, or if he repeatedly fails to make prompt payments to SUBCONTRACTORS or for labor, materials or equipment or if he disregards laws, ordinances, rules, regulations or orders of any public body having jurisdiction of the WORK or if he disregards the authority of the ENGINEER, or if he otherwise violates any provision of the CONTRACT DOCUMENTS, then the OWNER may, without prejudice to any other right or remedy and after giving the CONTRACTOR and his surety a minimum of ten (10) days from delivery of a WRITTEN NOTICE, terminate the services of the CONTRACTOR and take possession of the PROJECT and of all materials, equipment, tools, construction equipment and machinery thereon owned by the CONTRACTOR, and finish the WORK by whatever method he may deem expedient. In such case the CONTRACTOR shall not be entitled to receive any further payment until the WORK is finished. If the unpaid balance of the CONTRACT PRICE exceeds the direct and indirect costs of completing the PROJECT, including compensation for additional professional services, such excess SHALL BE PAID TO THE CONTRACTOR. If such costs exceed such unpaid balance, the CONTRACTOR will pay the difference to the OWNER. Such costs incurred by the OWNER will be determined by the ENGINEER and incorporated in a CHANGE ORDER.

18.3 Where the CONTRACTOR'S services have been so terminated by the OWNER, said termination shall not affect any right of the OWNER against the CONTRACTOR then existing or which may thereafter accrue. Any retention or payment of monies by the OWNER due the CONTRACTOR will not release the CONTRACTOR from compliance with the CONTRACT DOCUMENTS.

GENERAL CONDITIONS

18.4 After ten (10) days from delivery of a WRITTEN NOTICE to the CONTRACTOR and the ENGINEER, the OWNER may, without cause and without prejudice to any other right or remedy, elect to abandon the PROJECT and terminate the Contract. In such case, the CONTRACTOR shall be paid for all WORK executed and any expense sustained plus reasonable profit.

18.5 If, through no act or fault of the CONTRACTOR, the WORK is suspended for a period of more than ninety (90) days by the OWNER or under an order of court or other public authority, or the ENGINEER fails to act on any request for payment within thirty (30) days after it is submitted, or the OWNER fails to pay the CONTRACTOR substantially the sum approved by the ENGINEER or awarded by arbitrators within thirty (30) days of its approval and presentation, then the CONTRACTOR may after ten (10) days from delivery of a WRITTEN NOTICE to the OWNER and the ENGINEER, terminate the CONTRACT and recover from the OWNER payment for all WORK executed and all expenses sustained. In addition and in lieu of terminating the CONTRACT, if the ENGINEER has failed to act on a request for payment or if the OWNER has failed to make any payment as aforesaid, the CONTRACTOR may upon ten (10) days written notice to the OWNER and the ENGINEER stop the WORK until he has been paid all amounts then due, which event and upon resumption of the WORK. CHANGE ORDERS shall be issued for adjusting the CONTRACT PRICE or extending the CONTRACT TIME or both to compensate for the costs and delays attributable to the stoppage of the WORK.

18.6 If the performance of all or any portion of the WORK is suspended, delayed, or interrupted as a result of a failure of the OWNER or ENGINEER to act within the time specified in the CONTRACT DOCUMENTS, or if no time is specified, within a reasonable time, an adjustment in the CONTRACT PRICE or extension of the CONTRACT TIME, or both, shall be made by CHANGE ORDER to compensate the CONTRACTOR for the costs and delays necessarily caused by the failure of the OWNER or ENGINEER.

19. PAYMENTS TO CONTRACTOR

19.1 At least ten (10) days before each progress payment falls due (but not more often than once a month) the CONTRACTOR will submit to the ENGINEER a partial payment estimate filled out and signed by the CONTRACTOR covering the WORK performed during period covered by the partial payment estimate and supported by such data as the ENGINEER may reasonably require. If payment is requested on the basis materials and equipment not incorporated in WORK but delivered and suitably stored at or near site, the partial payment estimate shall also be accompanied by such supporting data, satisfactory to OWNER, as will establish the OWNER's title to the material and equipment and protect his interest therein

including applicable insurance. The ENGINEER within ten (10) days after receipt of each partial payment estimate, either indicate in writing his approval of payment and present the partial payment estimate to the OWNER, or return the partial payment estimate to the CONTRACTOR indicating in writing his reasons refusing to approve payment. In the latter case, CONTRACTOR may make the necessary corrections and resubmit the partial payment estimate. The OWNER will, within ten (10) days of presentation to him of an approved partial payment estimate, pay the CONTRACTOR a progress payment on the basis of the proved partial payment estimate. The OWNER shall retain ten (10) percent of the amount of each payment till final completion and acceptance of all work covered by the CONTRACT DOCUMENTS. The OWNER at time, however, after fifty (50) percent of the WORK has been completed, if he finds that satisfactory progress is being made, shall reduce retainage to five percent on the current and remaining estimates. The WORK is substantially complete (operations beneficial occupancy), the retained amount may further be reduced below five (5) percent to only that amount necessary to assure completion. On completion and acceptance of a part of the WORK on which price is stated separately in the CONTRACT DOCUMENTS, payment may be made in full, including retained percentages, less authorized deductions.

19.2 The request for payment may also include, allowance for the cost of such major materials equipment which are suitably stored either at or near the site.

19.3 Prior to SUBSTANTIAL COMPLETION, the OWNER, with the approval of the ENGINEER and with the concurrence of the CONTRACTOR, may use any completed or substantially completed portions of the WORK. Such use shall not constitute an acceptance of such portions of the WORK.

19.4 The OWNER shall have the right to enter the premises for the purpose of doing work not covered by the CONTRACT DOCUMENTS. This provision shall not be construed as relieving the CONTRACTOR of the sole responsibility for the care and protection of the WORK, or the restoration of any damaged WORK except such as may be caused by agents or employees of the OWNER.

19.5 Upon completion and acceptance of the WORK, the ENGINEER shall issue a certificate attached to the final payment request that the WORK has been accepted by him under the conditions of the CONTRACT DOCUMENTS. The entire balance found to be due the CONTRACTOR, including the retained percentages, but except such sums as may be lawfully retained by the OWNER, shall be paid to the CONTRACTOR within thirty (30) days of completion and acceptance of the WORK.

19.6 The CONTRACTOR will indemnify and save the OWNER or the OWNER'S agents harmless from all claims growing out of the lawful demands of SUBCONTRACTORS,

GENERAL CONDITIONS

laborers, workmen, mechanics, materialmen, and furnishes of machinery and parts thereof, equipment, tools, and all supplies, incurred in the furtherance of the performance of the WORK. The CONTRACTOR shall, at the OWNER'S request, furnish satisfactory evidence that all obligations of the nature designated above have been paid, discharged, or waived. If the CONTRACTOR fails to do so the OWNER may, after having notified the CONTRACTOR, either pay unpaid bills or withhold from the CONTRACTOR'S unpaid compensation a sum of money deemed reasonably sufficient to pay any and all such lawful claims until satisfactory evidence is furnished that all liabilities have been fully discharged whereupon payment to the CONTRACTOR shall be resumed, in accordance with the terms of the CONTRACT DOCUMENTS, but in no event shall the provisions of this sentence be construed to impose any obligations upon the OWNER to either the CONTRACTOR, his Surety, or any third party. In paying any unpaid bills of the CONTRACTOR, any payment so made by the OWNER shall be considered as a payment made under the CONTRACT DOCUMENTS by the OWNER to the CONTRACTOR and the OWNER shall not be liable to the CONTRACTOR for any such payments made in good faith.

19.7 If the OWNER fails to make payment thirty (30) days after approval by the ENGINEER, in addition to other remedies available to the CONTRACTOR, there shall be added to each such payment interest at the maximum legal rate commencing on the first day after said payment is due and continuing until the payment is received by the CONTRACTOR.

20. ACCEPTANCE OF FINAL PAYMENTS RELEASE

20.1 The acceptance by the CONTRACTOR of final payment shall be and shall operate as a release to the OWNER of all claims and all liability to the CONTRACTOR other than claims in stated amounts as may be specifically excepted by the CONTRACTOR for all things done or furnished in connection with this WORK and for every act and neglect of the OWNER and others relating to or arising out of this WORK. Any payment, however, final or otherwise, shall not release the CONTRACTOR or his sureties from any obligations under the CONTRACT DOCUMENTS or the Performance BOND and Payment BONDS.

21. INSURANCE

21.1 The CONTRACTOR shall purchase and maintain such insurance as will protect him from claims set forth below which may arise out of or result from the CONTRACTOR'S execution of the WORK, whether such execution be by himself or by any SUBCONTRACTOR or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable:

21.1.1 Claims under workmen's compensation, disability benefit and other similar employee benefit acts;

21.1.2 Claims for damages because of bodily injury, occupational sickness or disease, or death of his employees;

21.1.3 Claims for damages because of bodily injury, sickness or disease, or death of any person other than his employees;

21.1.4 Claims for damages insured by usual personal injury liability coverage which are sustained (1) by any person as a result of an offense directly or indirectly related to the employment of such person by the CONTRACTOR, or (2) by any other person; and

21.1.5 Claims for damages because of injury to or destruction of tangible property, including loss of use resulting therefrom.

21.2 Certificates of Insurance acceptable to the OWNER shall be filed with the OWNER prior to commencement of the WORK. These Certificates shall contain a provision that coverage afforded under the policies will not be canceled unless at least fifteen (15) days prior WRITTEN NOTICE has been given to the OWNER.

21.3 The CONTRACTOR shall procure and maintain, at his own expense, during the CONTRACT TIME, liability insurance as hereinafter specified;

21.3.1 CONTRACTOR'S General Public Liability and Property Damage Insurance including vehicle coverage issued to the CONTRACTOR and protecting him from all claims for personal injury, including death, and all claims for destruction of or damage to property, arising out of or in connection with any operations under the CONTRACT DOCUMENTS, whether such operations be by himself or by any SUBCONTRACTOR under him, or anyone directly or indirectly employed by the CONTRACTOR or by a SUBCONTRACTOR under him. Insurance shall be written with a limit of liability of not less than \$500,000 for all damages arising out of bodily injury, including death, at any time resulting therefrom, sustained by any one person in any one accident; and a limit of liability of not less than \$500,000 aggregate for any such damages sustained by two or more persons in any one accident. Insurance shall be written with a limit of liability of not less than \$200,000 for all property damage sustained by any one person in any one accident; and a limit of liability of not less than \$200,000 aggregate for any such damage sustained by two or more persons in any one accident.

GENERAL CONDITIONS

21.3.2 The CONTRACTOR shall acquire and maintain, if applicable, Fire and Extended Coverage insurance upon the PROJECT to the full insurable value thereof for the benefit of the OWNER, the CONTRACTOR, and SUBCONTRACTORS as their interest may appear. This provision shall in no way release the CONTRACTOR or CONTRACTOR'S surety from obligations under the CONTRACT DOCUMENTS to fully complete the PROJECT.

21.4 The CONTRACTOR shall procure and maintain, at his own expense, during the CONTRACT TIME, in accordance with the provisions of the laws of the state in which the work is performed, Workmen's Compensation Insurance, including occupational disease provisions, for all of his employees at the site of the PROJECT and in case any work is sublet, the CONTRACTOR shall require such SUBCONTRACTOR similarly to provide Workmen's Compensation Insurance, including occupational disease provisions for all of the latter's employees unless such employees are covered by the protection afforded by the CONTRACTOR. In case any class of employees engaged in hazardous work under this contract at the site of the PROJECT is not protected under Workmen's Compensation statute, the CONTRACTOR shall provide, and shall cause each SUBCONTRACTOR to provide, adequate and suitable insurance for the protection of his employees not otherwise protected.

21.5 The CONTRACTOR shall secure, if applicable, "All Risk" type Builder's Risk Insurance for WORK to be performed. Unless specifically authorized by the OWNER, the amount of such insurance shall not be less than the CONTRACT PRICE totaled in the BID. The policy shall cover not less than the losses due to fire, explosion, hail, lightning, vandalism, malicious mischief, wind, collapse, riot, aircraft, and smoke during the CONTRACT TIME, and until the WORK is accepted by the OWNER. The policy shall name as the insured the CONTRACTOR, the ENGINEER, and the OWNER.

22. CONTRACT SECURITY

22.1 The CONTRACTOR shall within ten (10) days after the receipt of the NOTICE OF AWARD furnish the OWNER with a Performance Bond and a Payment Bond in penal sums equal to the amount of the CONTRACT PRICE, conditioned upon the performance by CONTRACTOR of all undertakings, covenants, terms, conditions, and agreements of the CONTRACT DOCUMENTS, and upon the prompt payment by the CONTRACTOR to all persons supplying labor and materials in the prosecution of the WORK provided by the CONTRACT DOCUMENTS. Such BONDS shall be executed by the CONTRACTOR and a corporate bonding company licensed to transact such business in the state in which the WORK is to be performed and named on the current list of "Surety Companies Acceptable on the Federal Bonds" as published in the

Treasury Department of Circular Number 570. The expense of these BONDS shall be borne by the CONTRACTOR. If at any time a surety on any such BOND is declared a bankrupt or loses its right to do business in the state in which the WORK is to be performed or is remove from the list of Surety Companies accepted on Federal BONDS. CONTRACTOR shall within ten (10) days after notice from the OWNER to do so, substitute an acceptable BOND (or BONDS) in such form and sum signed by such other surety or sureties as may be satisfactory to the OWNER. The premium on such BOND shall be paid by the CONTRACTOR. No further payments shall be deemed due nor shall be made until the new surety or sureties shall have furnished an acceptable BOND to the OWNER.

23. ASSIGNMENTS

23.1 Neither the CONTRACTOR nor the OWNER shall sell, transfer, assign or otherwise dispose of the Contract or any portion thereof, or of his right, title or interest therein, or his obligations thereunder, without written consent of the other party.

24. INDEMNIFICATION

24.1 The CONTRACTOR will indemnify any hold harmless the OWNER and the ENGINEER and their agents and employees from and against all claims damages, losses, and expenses including attorney's fees arising out of or resulting from the performance of the WORK, provided that any such claims, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property including the loss of use resulting therefrom: and is caused in whole or in part by any negligent or willful act or omission of the CONTRACTOR or SUBCONTRACTOR, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable.

24.2 In find, and all claims against the OWNER or the ENGINEER or ANY of their agents or employees, by any employee of the CONTRACTOR, any SUBCONTRACTOR, anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable, the indemnification obligation shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for the CONTRACTOR or any SUBCONTRACTOR under workmen's compensation acts, disability benefit acts or other employee benefits acts.

24.3 The obligation of the CONTRACTOR under this paragraph shall not extend to the liability of the ENGINEER, his agents or employees arising out of the preparation or approval of maps, DRAWINGS, opinions, reports, surveys, CHANGE ORDERS, designs or SPECIFICATIONS.

GENERAL CONDITIONS

25. SEPARATE CONTRACTS

25.1 The OWNER reserves the right to let other contracts in connection with this PROJECT. The CONTRACTOR shall afford other CONTRACTORS reasonable opportunity for the introduction and storage of their materials and the execution of their WORK, and shall properly connect and coordinate his WORK with theirs. If the proper execution or results of any part of the CONTRACTOR'S WORK depends upon the WORK of any other CONTRACTOR, the CONTRACTOR shall inspect and promptly report to the ENGINEER any defects in such WORK that renders it unsuitable for such proper execution and results.

25.2 The OWNER may perform additional WORK related to the PROJECT by himself, or he may let other contracts containing provisions similar to these. The CONTRACTOR will afford the other CONTRACTORS who are parties to such Contracts (or the OWNER, if he is performing the additional WORK himself), reasonable opportunity for the introduction and storage of materials and equipment and the execution of WORK, and shall properly connect and coordinate his WORK with theirs.

25.3 If the Performance of additional WORK by other CONTRACTORS or the OWNERS is not noted in the CONTRACT DOCUMENTS prior to the execution of the CONTRACT written notice thereof shall given to the CONTRACTOR prior to starting any such additional WORK. If the CONTRACTOR believes that the performance of such additional WORK by the OWNER or other involves him in additional expense or entitles him to an extension of the CONTRACT TIME, he may make a claim therefor as provided in Sections 14 and 15.

26. SUBCONTRACTING

26.1 The CONTRACTOR may utilize the services of specialty SUBCONTRACTORS on those parts of the WORK which, under normal circumstances practices, are performed by specialty SUBCONTRACTORS.

26.2 The CONTRACTOR shall not award WORK to SUBCONTRACTOR(s) in excess of fifty (50%) percent of the CONTRACT PRICE, without prior written approval of the OWNER.

26.3 The CONTRACTOR shall be fully responsible to the OWNER for the acts and omissions of his SUBCONTRACTORS, and of persons either directly or indirectly employed by them, as he for the acts and omissions of persons directly employed by him.

26.4 The CONTRACTOR shall cause appropriate provisions to be inserted in all subcontractors relative to the WORK to bind SUBCONTRACTORS to the CONTRACT by the terms of the CONTRACT DOCUMENTS insofar as applicable to the WORK of SUBCONTRACTORS and to

give the CONTRACTOR the same power as regards terminating any subcontract that the OWNER may exercise over the CONTRACTOR under the provision of the CONTRACT DOCUMENTS.

26.5 Nothing contained in this CONTRACT shall create any contractual relation between any SUBCONTRACTOR and the OWNER.

27. ENGINEER'S AUTHORITY

27.1 The ENGINEER shall act as the OWNER'S representative during the construction period. He shall decide questions which may arise as to quality and acceptability of materials furnished and WORK performed. He shall interpret the intent of the CONTRACT DOCUMENTS in a fair and unbiased manner. The ENGINEER will make visits to the site and determine the WORK is proceeding in accordance with the CONTRACT DOCUMENTS.

27.2 The CONTRACTOR will be held strictly to the intent of the CONTRACT DOCUMENTS in regard to the quality of materials, workmanship and execution of the WORK. Inspections may be made at the factory or fabrication plant of the source of material supply.

27.3 The ENGINEER will not be responsible for construction means, controls, techniques, sequences, procedures, or construction safety.

27.4 The ENGINEER shall promptly make decisions relative to interpretation of the CONTRACT DOCUMENTS.

28. LAND AND RIGHTS-OF-WAY

28.1 Prior to issuance of NOTICE TO PROCEED the OWNER shall obtain all land and rights-of-way necessary for carrying out and for the completion of the WORK to be performed pursuant to the CONTRACT DOCUMENTS, unless otherwise mutually agreed.

28.2 The OWNER shall provide to the CONTRACTOR information which delineates and describes the owned and rights-of-way acquired.

28.3 The CONTRACTOR shall provide at his expense and without liability to the OWNER any additional land and access thereto that the CONTRACTOR may desire for temporary construction facilities, or for storage of materials.

29. GUARANTY

29.1 The CONTRACTOR shall guarantee all materials and equipment furnished and WORK performed for a period of one (1) year from the date of SUBSTANTIAL COMPLETION. The CONTRACTOR warrants and guarantees for a period of one (1) year from the date of SUBSTANTIAL COMPLETION of the system that the

GENERAL CONDITIONS

completed system is free from all defects faulty materials or workmanship and the CONTRACTOR shall promptly make such corrections as necessary by reason of such defects including the repairs of any damage to other parts of the system resulting from such defects. The OWNER will give notice of observed defects with reasonable promptness. In the event that the CONTRACTOR should fail to make such repairs, adjustments, or other WORK that may be made necessary by such defects, the OWNER may do so and charge the CONTRACTOR the cost thereby incurred. The Performance BOND shall remain in full force and effect through the guarantee period.

30. *ARBITRATION*

30.1 All claims, disputes and other matters in question arising out of, or relating to, the CONTRACT DOCUMENTS or the breach thereof, except for claims which have been waived by the making and acceptance of final payment as provided by Section 20, shall be decided by arbitration in accordance with the Construction Industry Arbitration Rules of the American Arbitration Association. This agreement to arbitrate shall be specifically enforceable under the prevailing arbitration law. The award rendered by the arbitrators shall be final, and judgment may be entered upon it in any court having jurisdiction thereof.

30.2 Notice of the demand for arbitration shall be filed in writing with the other party to the CONTRACT DOCUMENTS and with the American Arbitration Association, and a copy shall be filed with the ENGINEER. Demand for arbitration shall in no event be made on any claim, dispute or other matter in question which would be barred by the applicable statute of limitations.

30.3 The CONTRACTOR will carry on the WORK and maintain the progress schedule during any arbitration proceedings, unless otherwise mutually agreed in writing.

31. *TAXES*

31.1 The CONTRACTOR will pay all sales, consumer, use and other similar taxes required by the law of the place where the WORK is performed.

SPECIAL REQUIREMENTS

1. Application of Special Requirements

Items listed in these Special Requirements are specific to this project. They replace, add-to or amend the Information for Bidders, General Conditions, Supplementary Conditions and/or the General Construction Specifications. Whenever conditions as set forth in any of the Specifications conflict with conditions of other Sections of the Specifications, the following order of precedence shall apply:

- a. Special Requirements
- b. Supplementary Conditions
- c. General Conditions
- d. Information for Bidders
- e. Construction Specifications

2. Definitions

In the case of this Project, the Owner is the Shipshewana Community Lake Improvement Association, LaGrange County, Indiana, and the Engineer shall be a qualified individual or corporation as designated by the Owner.

3. Federal Grants and Loans

This Project will be financed in part by a Build Indiana Grant and in part by local funds.

4. Use of Chemicals

All chemicals used during project construction or furnished for project operation, whether herbicide, pesticide, disinfectant, polymer, reactant or other classification, must show approval of either EPA or USDA- Use of all such chemicals and disposal of residues shall be in conformance with instructions.

5. Existing Utilities

Existing utilities in the Project site are as follows: There are no known existing utilities within the Project site.

6. Hazard Communication Standard

Pursuant to the Code of Federal Regulations, 29 CFR Part 1926, as may be amended, all Contractors, Subcontractors and materials suppliers on this Project shall provide access to all persons on the job site at all times the Material Safety Data Sheets (MSDS) for all hazards of all chemicals per the Federal Regulations.

In addition, contractors, sub-contractors and material suppliers shall provide training to their employees on the MSDS pursuant to the Federal Regulations.

SPECIAL REQUIREMENTS

7. Excavation Safety Requirements

It shall be the duty and responsibility of the Contractor and all of its Subcontractors to be familiar and comply with all requirements of Public Law 91-596 29 U.S.C., Sections 651 et. seq., the Occupational Safety and Health Act of 1970 (OSHA) and all amendments thereto and to enforce and comply with all of the provisions of the Act. In addition and as required by Indiana State Law, BB 207 1, Section 14. of IC 4-13.6-5-12, the Contractor and all of its Subcontractors shall comply with Subpart P of 29 CFR 1926 dated October 31, 1989 as may be amended.

Costs of all Excavation Protection shall be paid for as a separate pay item or be included in the pay item of the principal work with which the safety systems are associated as required by the Bid Proposal Documents.

8. Confined Space Access

For projects which include construction activities within "confined spaces" as defined in Title 29 CFR Part 1910.146, the Contractor is hereby advised that he must fully comply with all pertinent requirements as delineated in this regulation and as interpreted by OSHA. The Contractor shall have and maintain all necessary safety and testing equipment at all times during the course of the construction activity. In addition it shall be the Contractor's responsibility to make this equipment available for use by the Owner or the Owner's Representative on the project site. If the Owner or the Owner's Representative requires the use of this equipment during the course of observing or verifying the construction, it shall be made available in a timely fashion. If the owner or the Owner's Representative is unable to observe or verify a portion of the construction due to a lack of the necessary safety or testing equipment, any resulting delays and/or expenses shall be the responsibility of the Contractor.

This equipment shall include a gas monitor capable of detecting oxygen, combustibles, and toxics including carbon monoxide and hydrogen sulfide. A metal oxide (broad based) sensor may be used in lieu of the individual carbon monoxide and hydrogen sulfide sensors. Contractor shall provide gas monitor calibration certifications to Engineer to verify proper maintenance.

9. Use Of Crawler Equipment On Roads

The Contractor shall not use or operate tractors, bulldozers, or other power operated equipment the treads or wheels of which are so shaped as to cut or otherwise injure such surfaces, on paved surfaces unless pavement is sufficiently protected in a manner satisfactory to the Engineer. All surfaces which have been injured by the Contractor's operations shall be restored to a condition at least equal to that in which they were found immediately before work was begun. Suitable materials and methods shall be used for such restoration. The restoration of existing property or structures shall be done as promptly as practicable and shall not be left until the end of the construction period.

10. Dust, Noise And Working Hours

Dust shall be minimized by use of water and deliquescent salts. Noise shall be minimized by use of properly constructed and maintained equipment provided with suitable mufflers, snubbers, and other

SPECIAL REQUIREMENTS

sound attenuating devices and supports. Unless specifically approved by the Owner, all work will be restricted to daylight hours.

11. Project Site Erosion Control

The Contractor shall be responsible to comply with all aspects of 327 IAC 15-5, Rule 5, "Storm Water Run-Off Associated with Construction Activity". The Contractor shall submit all necessary fees and documents to the Indiana Department of Environmental Management (IDEM) prior to any construction activity. The Contractor shall be responsible for compliance with this Law throughout the construction period and shall pay any and all fines resulting from any violation, suit or penalty for noncompliance. See DIVISION 2 SITEWORK, Section 02110 - Erosion and Sediment Control Plan.

12. Permits

The following list of Permits have been included with these Special Provisions to insure that all requirements of the Permits are known by the Contractor prior to bidding. Any provision of these Permits which conflicts with the Plans and Specifications must be adhered to.

- A. Indiana Department of Natural Resources approval of work within the flood way
- B. Corps of Engineers - Section 404
- C. LaGrange County Drainage Board

The Contractor shall comply with all provisions of these permits. The Contractor shall obtain and pay for all other permits, licenses and other authorizations required for the prosecution of the work, including the cost of all work performed in compliance with the terms and conditions of such permits, licenses and authorizations, whether by himself or others.

13. Wage Scale

The Wage Scale for this Project shall be set by the proper Local Authorities and shall meet local prevailing wages..

14. Additions, Deletions and Revisions to the Specifications

- A. Section 01220 - Progress Meetings

Progress meetings will not be periodic but will only be requested by the Owner if the Owner believes the Contractor is not meeting his schedule or believes specific issues regarding the project need to be discussed between the Contractor, Engineer and Owner.

- B. Section 01310 - Progress Schedules

Progress schedules will only need to be updated and submitted if either the Contractor or Owner believe that delays or specific events have substantially impacted the project schedule.

SPECIAL REQUIREMENTS

C. Section 01381 -Video Taped Inventory Control

Video taping is not required, but is recommended to protect the Contractor from potential claims by landowners. The Owner and Engineer shall be held harmless from such claims by landowners resulting from the Contractor's operations in completing the Work.

DIVISION 1

**GENERAL
REQUIREMENTS**

SECTION 01010
SUMMARY OF THE WORK

PART 1 - GENERAL

1.1 SCOPE

- A. The intent and meaning of the Contract Documents require that the Contractors, under the terms of the Contract, shall take such action as necessary and/or required to provide labor, plant, materials, equipment, transportation, facilities and appurtenances thereto, which are indicated, or reasonably implied by each Plan, and each Section of the Specifications, all of which are collectively necessary and required for the execution of the Work.
- B. The Work shall be constructed as described under subsection 1.2 DESCRIPTION OF WORK.

1.2 DESCRIPTION OF THE WORK

- A. The work includes, but is not limited to, earth-moving to create ponds and wetlands at each site, stream bank stabilization with rip-rap, seeding and wetland vegetation, and all other work as described in the Project Manual and as shown on the Plans.

1.3 PERMITS AND REGULATIONS

- A. Refer to the General Conditions for further information regarding permit requirements.
- B. The Contractor's responsibility includes compliance with Federal, State and Local regulations which in any way affect the work or implementation of the project.

1.4 EXISTING CONDITIONS

- A. Refer to the Instructions to Bidders for the Contractor's responsibility for his knowledge of the existing conditions.
- B. When working in the area of existing retaining walls, the contractor shall, prior to construction, determine the depth of foundations in order to determine if a deviation in horizontal or vertical location of any underground utilities may be required. The Contractor shall plot the actual depth of the foundation on the Contractors record plans. The Contractor shall immediately report to the Owner if it is determined that the bottom of the wall will interfere with or influence the work.
- C. When working in the area of Industrial buildings, trailer parks or in plant parking lots the Contractor shall coordinate all work with the Superintendent.
- D. All work adjacent to existing buildings, shall be done in accordance with Sections 02150, 02200, and all other appropriate sections of this Specification.

SECTION 01010
SUMMARY OF THE WORK

1.5 CONTRACTORS USE OF PREMISES

- A. The Contractor shall limit his use of the premises for Work and for storage, to allow for:
 - 1. Work by other Contractors
 - 2. Owner occupancy
 - 3. Public use
- B. Coordinate use of premises with Owner.
- C. Assume full responsibility for the protection and safekeeping of Products under this Contract, stored on the site.
- D. Move any stored Products, under Contractor's control, which interfere with operations of the owner or separate contractor.
- E. Obtain and pay for the use of additional storage or work areas needed for operations.
- F. The Contractor shall not park vehicles or equipment in front of driveways or on private property.

1.6 SPECIAL PRECAUTIONS

- A. General
 - 1. Where trench crosses drainageway, drainageway shall not be left blocked after working hours.
 - 2. The Contractor shall, when working in areas where overhead wires are encountered, take special precautions. If necessary, wires shall be removed and temporary services placed. The cost for this work shall be included in the bid.
- B. Existing Utilities
 - 1. The site and the limits of construction under this Contract may contain existing underground utilities and structures which are not shown on the Plans. The data pertaining to size, location, and depth of the existing underground utilities and structures that are shown on the Plans are for general information only.
 - a. Prior to construction, the Contractor shall determine in the field the exact location and depth of all affected existing utility lines.
 - b. In order to determine if a deviation in horizontal or vertical location of the work may be required, the Contractor shall plot the actual location and depths of existing utilities on the Contractor's record plans. The Contractor shall immediately report to the Owner if an interference is apparent.

SECTION 01010
SUMMARY OF THE WORK

- C. All physical features disturbed during construction shall be restored to an equal or better condition which existed prior to construction, unless otherwise noted on the Drawings.
- D. Rights-of-Way
 - 1. When temporary rights-of-way are to be used by the Contractor for installation of pipelines, excavated material and construction materials are not to be stored in these rights-of-way.
 - 2. Private property items damaged by the Contractor within these temporary rights-of-way shall be replaced in kind at the Contractor's expense.

++ END OF SECTION ++

SECTION 01035
CHANGE ORDER PROCEDURE

PART 1 - GENERAL

1.1 SCOPE

- A. This section lists the procedures necessary to make changes in the Work, in the Contract Sum, in the Contract Time of Completion, or any combination thereof, as are described in written Change Orders signed by the Owner and the Engineer and issued after the execution of the Contract.
- B. Related work:
 - 1. Documents affecting work of this section include, but are not limited to, GENERAL CONDITIONS, SUPPLEMENTARY CONDITIONS, and Sections in Division 1 of these Specifications
 - 2. Changes in the Work are described further in the GENERAL CONDITIONS.
 - 3. Engineer's supplemental instructions:
 - a. From time to time during progress of the Work, the Engineer may issue supplemental instructions which interpret the Contract Documents or order minor changes in the Work without change in the Contract Sum or Contract Time.
 - b. Should the Contractor consider that a change in Contract Sum or Contract Time is required, he shall submit and itemized proposal to the Engineer immediately and before proceeding with the Work. If the proposal is found to be satisfactory and in proper order, the supplemental instructions in that event will be superseded by a Change Order.
 - 4. Proposal requests:
 - a. From time to time during the progress of the Work, the Engineer may issue a proposal request for an itemized quotation for changes in the Contract Sum and/or Contract Time incidental to proposed modifications to the Contract Documents.
 - b. This will not be a Change Order, and will not be a direction to proceed with the changes described therein.

1.2 QUALITY ASSURANCE

- A. Include within the Contractor's quality assurance program such measures as are needed to assure familiarity of the Contractor's staff and employees with these procedures for processing Change Order Data.

SECTION 01035
CHANGE ORDER PROCEDURE

1.3 DELIVERY, STORAGE, AND HANDLING

- A. The Contractor shall maintain a "Register of proposal requests, supplemental instructions, and Change Orders" at the job site, accurately reflecting current status of all pertinent data.
- B. The Contractor shall make the Register available to the Engineer for review at his request.

1.4 PROCESSING PROPOSAL REQUESTS

- A. The Contractor shall make written reply to the Owner in response to each proposal request. The reply shall contain the following information:
 - 1. Proposed change in the Contract Sum, if any
 - 2. Proposed change in the Contract Time of Completion, if any
 - 3. Description of other changes in the Work, if any
 - 4. Any back-up data such as subcontractor's letter of proposal, etc.
 - 5. Submit this response in single copy.
- B. When cost or credit for the change has been agreed upon by the Owner and the Contractor, or the Owner has directed that cost or credit be determined in accordance with provisions of the GENERAL CONDITIONS, the Engineer will issue a Change Order to the Contractor.

1.5 PROCESSING CHANGE ORDERS

- A. Change Orders will be numbered in sequence and dated.
 - 1. The Change Order will describe the change or changes, will refer to the proposal requests or supplemental instructions involved, and will be signed by the Owner and the Engineer.
 - 2. The Engineer will issue four copies of each Change Order to the Contractor.
 - a. The Contractor promptly shall sign all four copies and return three copies to the Engineer.
 - b. The Engineer will retain one signed copy in his file, will forward one signed copy to the Owner, and will forward one signed copy to the Owner.

++ END OF SECTION ++

SECTION 01045
CUTTING AND PATCHING

PART I - GENERAL

1.1 DESCRIPTION

- A. Related requirements specified elsewhere:
 - 1. Summary of Work: Section 01010.
- B. Execute Cutting (including Excavating), fitting or patching of work, required to:
 - 1. Make several parts fit properly.
 - 2. Uncover work to provide for installation of ill-timed work.
 - 3. Remove and replace defective work.
- C. In addition to Contract requirements, upon written instructions of Engineer:
 - 1. Uncover work to provide for Engineer's observation of covered work.
 - 2. Remove samples and install materials for testing.
 - 3. Remove work to provide for alteration of existing work.
- D. Perform no cutting or altering which may endanger any part of the work.
- E. Do not cut or alter work of another contractor without written consent of the Engineer.

1.2 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

1.3 SUBMITTALS

- A. Prior to the commencement of any cutting, which affects the structural safety of the project or work of another contractor, submit written notice to Engineer requesting consent to proceed. Included in such a request shall be:
 - 1. Identification of project.
 - 2. Description of affected work.
 - 3. Necessity for cutting.
 - 4. Effect on other work or structural integrity of the project.
 - 5. Description of proposed work, designating:
 - a. Scope of cutting and patching

SECTION 01045

CUTTING AND PATCHING

- b. Contractor and trade to execute work
 - c. Products proposed to be used
 - d. Extent of refinishing
 - e. Methods to maintain traffic flow and plant operations
 - 6. Alternative to cutting and patching.
 - 7. Designation of party responsible for cost of cutting and patching.
 - 8. Coordinate work with plant operators.
 - B. Submit cost estimate prior to cutting and patching done on the construction site that is not under the scope of the specified work at the request of the Project Engineer.
 - C. Should conditions of work or schedule indicate change of material or methods, submit written recommendations to Engineer, including:
 - 1. Conditions indicating change to recommendations for alternative materials or methods.
 - 2. Submittal as required for substitutions.
 - D. Submit written notice to Engineer designating the work will be uncovered to provide for observation.
- 1.4 **RESPONSIBILITY OF PAYMENT FOR COSTS**
- A. Costs caused by defective work or work not conforming to Contract Documents including costs for additional services of the Engineer shall be paid by the party responsible for the rejected or nonconforming work.
 - B. Costs of work done on instructions of the Engineer and not covered under the scope of these Specifications shall be borne by the Owner.

PART 2 - PRODUCTS

- 2.1 Materials for replacement of work removed shall comply with the Specifications for type of work to be done.
- 2.2 Where existing concrete or bituminous pavement or concrete sidewalk is cut and removed, the pavement or sidewalk shall be replaced as shown in the plans. All existing pavement or sidewalk cut and removed, not covered by details in the plans, shall be replaced in kind to the shape, depth and grade of the existing item removed. All work under this item shall be in accordance with the Standard Specifications.

SECTION 01045
CUTTING AND PATCHING

PART 3 - EXECUTION

3.1 INSPECTION

- A. Inspect existing conditions of work, including elements subject to movement or damage during:
 - 1. Cutting and patching
 - 2. Excavating and backfilling
- B. After uncovering, inspect conditions affecting installation of new products.

3.2 PREPARATION PRIOR TO CUTTING

- A. Apply shoring, bracing and support as required to maintain structural integrity of Project facilities.
- B. Apply protection for other portions of work.
- C. Apply protection from weather.
- D. Barriers required to protect pedestrian and vehicular traffic.

3.3 PERFORMANCE

- A. Execute fitting and adjustment of products to provide finished installation to comply with specified tolerances and finishes.
- B. Execute cutting and demolition by methods which prevent damage to other work and provide proper services to receive installation and repairs and new work.
- C. Execute excavating and backfilling as specified.
- D. Restore work which has been cut or removed, install new parts provided to complete the work in accordance with the requirements of Contract Documents.
- E. Refinish entire surfaces as necessary to provide an even finish.
 - 1. continue new finish on surfaces to nearest change of material or direction.

++ END OF SECTION ++

SECTION 01050
FIELD ENGINEERING

PART 1 - GENERAL

1.1 SCOPE

- A. Provide such field engineering services as are required for proper completion of the Work including, but not limited to:
 - 1. Location of Existing Utilities
 - 2. Establishing and maintaining lines and levels
 - 3. Structural design of shores, forms, and similar items provided by the Contractor as part of his means and methods of construction.
- B. Related Work Specified Elsewhere
 - 1. Act No. 287
 - 2. Section 02200, EARTHWORK
 - 3. Section 03100, CONCRETE FORMWORK

1.2 SUBMITTALS

- A. Contractor shall furnish the Engineer a certification listing the names of the users whom he has contacted during the course of construction.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers which have been in satisfactory used in similar service for three (3) years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.

PART 2 - MATERIALS: Not applicable to this section.

PART 3 - EXECUTION

3.1 LOCATION OF EXISTING UTILITIES

- A. General
 - 1. The Contractor, prior to performing excavation or demolition work on the job site, shall obtain all recorded locations of existing lines as outlined herein.

SECTION 01050
FIELD ENGINEERING

2. Attention is directed to the fact that there may be other lines in certain locations in addition to the recorded locations.
 3. Contractor shall comply with Indiana One Call System, Underground Utility Line Protection Law.
- B. It shall be the duty of each Contractor who intends to perform excavation or demolition work at a site within a political subdivision to ascertain the exact location and type of users' lines which are located within the limits of work of this contract.
- C. The Contractor is responsible for notifying "Indiana Underground Plant Protection Services", and any utilities that are not members of the above and may have facilities within the project area.

3.2 OBTAINING LOCATION OF EXISTING USERS' LINES

- A. The Contractor shall obtain the list of users from either of the following sources:
1. By inspection of the Contract Plans which show the approximate location of the user's facilities. Use of this information does not release the Contractor of the responsibility of obtaining a "current" listing if a reasonable amount of time has elapsed from award of the Contract to the actual time of excavation.
 2. By requesting a list of users from the Recorder of Deeds of the county in which the work is being performed.
- B. Not less than three (3) working days prior to the day of the excavation or demolition work shall begin, the Contractor shall request that each of the users with facilities within the limits of the work of this Contract locate these facilities in the field. Generally, this will include determining and locating the number, size, depth and horizontal position of all lines. (Also see Paragraph 3.3 of this Section, "Locating Lines".)
- C. The following are cooperative steps which the Contractor shall take, either at or off of the excavation or demolition site:
1. Before the Contractor starts any demolition work in the area of a particular user's line, the Contractor shall ascertain from the User if the user wants to have a representative present during the demolition within this area. Additionally, the Contractor will comply with all standard regulations and necessary precautions as may be required by the User.
 2. Inform each operator, employed by him at the site of such work, of the information obtained by him as noted above.
 3. Report immediately to the user any break or leak on its lines, or dent, gouge, groove, or other damage to such lines or to their coating or cathodic protection, made or discovered in the course of the excavation or demolition work.

SECTION 01050
FIELD ENGINEERING

4. Alert immediately the occupants of premises as to any emergency that the Contractor may create or discover at or near such premises.
 5. The requirements of paragraphs A, B, or C.2, above shall not apply to a user or Contractor performing excavation or demolition work in an emergency.
- D. All recorded or unrecorded lines, shall be located on the ground with pipe locating equipment well ahead of the work at all times. All such locations shall be plainly marked by coded paint symbols on pavement or by marked stakes in the ground. Such locations shall be established well in advance of all excavation. All such location work shall be provided by the Contractor to the satisfaction of the Engineer at no extra cost.

3.3 ADDITIONAL FIELD ENGINEERING

- A. In addition to procedures listed above and directed by the Contractor for proper performance of the Contractor's responsibilities, the Field Engineer shall perform the following duties:
1. Locate and protect control points before starting work on the site
 2. Preserve permanent reference points during progress of the Work
 3. Do not change or relocate reference points or items of the Work without specific approval from the Engineer.
 4. Promptly advise the Engineer when a reference point is lost or destroyed, or requires relocation because of other changes in the Work.
 - a. Upon direction of the Engineer, require the field engineer to replace reference stakes or markers.
 - b. Locate such replacements according to the original survey control.

++END OF SECTION++

SECTION 01210
PRE-CONSTRUCTION CONFERENCE

PART I - GENERAL

1.1 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

- A. Section 01010, SUMMARY OF WORK
- B. Section 01300, SHOP DRAWINGS, PRODUCT DATA & SAMPLES
- C. Section 01720, PROJECT RECORD DOCUMENTS

1.2 PRE-CONSTRUCTION MEETING

- A. The Owner will schedule and administer a preconstruction conference. The Owner will:
 - 1. Prepare the agenda;
 - 2. Distribute written notice of the meeting;
 - 3. Make physical arrangements for the meeting;
 - 4. Preside at the meeting;
 - 5. Record the meeting minutes; and
 - 6. Distribute copies of the minutes to the Contractor.
- B. The Engineer will schedule the pre-construction conference in accord with Paragraph 2.8 of the General Conditions.
- C. The following persons will attend the pre-construction conference:
 - 1. The Owner's Representative;
 - 2. The Contractor and its major subcontractors; and
 - 3. Representatives of governmental and other regulatory agencies as necessary.
- D. At a minimum, the agenda will include distribution and discussion of:
 - 1. The list of major subcontractors;
 - 2. The items required to be addressed by paragraph 2.8 of the General Conditions;
 - 3. The identification of personnel responsible for onsite and emergency situations;
 - 4. The processing of Field Orders, Work Directive Changes and Change orders;
 - 5. Procedures for maintaining Record Documents;
 - 6. Coordination of the Contractor's work with the work of the Owner's personnel;
 - 7. Security procedures;

SECTION 01210
PRE-CONSTRUCTION CONFERENCE

8. Housekeeping procedures;
9. Use of premises;
10. Major equipment deliveries and priorities; and
11. Critical work sequencing.

PART 2 - PAYMENT

2.1 BASIS OF PAYMENT

- A. There will be no separate payment work addressed in this section. The cost of this work is to be included by the Contractor in the total cost of the project.

++ END OF SECTION ++

SECTION 01220
PROGRESS MEETINGS

PART 1 - GENERAL

1.1 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

- A. Section 01010, SUMMARY OF WORK
- B. Section 01300, SUBMITTALS
- C. Section 01720, PROJECT RECORD DOCUMENTS

1.2 PROGRESS MEETINGS

- A. The Owner or his representative will schedule and administer a progress meetings. The Owner or his representative will:
 - 1. Prepare the agenda;
 - 2. Distribute written notice of the meeting;
 - 3. Make physical arrangements for the meeting;
 - 4. Preside at the meeting;
 - 5. Record the meeting minutes; and
 - 6. Distribute copies of the minutes to the Contractor within ten (10) days after each meeting.
- B. Regular bi-weekly meetings will be scheduled at a time mutually agreed upon by the Contractor and Owner.
- C. The Owner shall call special meetings as progress of the Work dictates.
- D. Meetings will be held in the Contractor's construction trailer, or as directed by the Owner.
- E. The following persons will attend the progress meetings:
 - 1. The Owner's Representative;
 - 2. The Contractor;
 - 3. Subcontractors as pertinent to agenda; and
 - 4. Representatives of governmental and other regulatory agencies having jurisdiction as required.
- F. At a minimum, the agenda will include:
 - 1. Review of the previous meetings;
 - 2. Review of the work progress since last meeting;

SECTION 01220
PROGRESS MEETINGS

3. Discussion of field observations, problems and decisions;
4. Identification of problems which impede planned progress;
5. Review of any off-site fabrication problems;
6. Discussion of corrective measures and procedures to regain planned schedule;
7. Review of the progress schedule as indicated;
8. Plan progress during next work period;
9. Review submittal schedules and expedite as required to maintain schedule;
10. Review the maintenance of quality and work standards;
11. Review any changes proposed by the owner; and
12. Complete other current business.

PART 2 - PAYMENT

2.1 BASIS OF PAYMENT

- A. There will be no separate payment work addressed in this section. The cost of this work is to be included by the Contractor in the total cost of the project.

++ END OF SECTION ++

SECTION 01341
MANUFACTURER'S RECOMMENDATIONS

PART 1 - GENERAL

1.1 GENERAL

- A. Whenever and wherever these Contract Documents indicate that the performance of a particular task shall be done in accordance with the manufacturer's recommendations and/or specifications or manufacturer's printed instructions, said recommendations and/or specifications shall be submitted in conformance with the requirements of Section 01300.

1.2 CONTRACTOR'S RESPONSIBILITIES

- A. The Contractor is responsible for reviewing and approving the specific manufacturer's recommendations and/or specifications and submitting same for the Engineer's review.
- B. In the event that the Contractor wishes to use a manufacturer that has no specific recommendations and/or specifications for a particular application, the Contractor shall be responsible for developing such a set of criteria based upon standard practice within the industry. This development shall be limited to points of procedure and cannot be extended to cover specific technical information relating to a particular manufacturer's product. Once these criteria are developed, the Contractor shall submit them to the Engineer for his review. This submittal shall clearly differentiate between those elements developed by the Contractor and those developed by the specific manufacturer.
- C. Should the Contractor be unable to develop the appropriate recommendations and/or specifications which are in conformance with the Contract Documents, he will be required to substitute a different product which already has the appropriate recommendations and/or specifications or which facilitates their development.
- D. The Contractor's responsibility for errors and omissions in submittals is not relieved by Engineer's review of submittals.
- E. The Contractor's responsibility for deviations in submittals from requirements of the Contract Documents is not relieved by the Engineer's review of submittals. The Contractor may submit specific deviations to the Engineer for review, but such deviations will require the manufacturer's and/or supplier's written approval for the specific deviation as a prerequisite to the Engineer's consideration or approval.
- F. The Contractor shall notify the Engineer, in writing at the time of submission, of deviations in submittals from requirements of the Contract Documents.
- G. The Contractor shall not begin work which requires submittals until return of the submittals.

1.3 ENGINEER'S DUTIES

- A. The Engineer shall attempt to review submittals within thirty (30) days from receipt of submission. The Contractor will be notified if additional time is required.

SECTION 01341

MANUFACTURER'S RECOMMENDATIONS

- B. The Engineer's review is only for conformance with the design concept of the Project and compliance with the information given in the Contract Documents. The Contractor is responsible for information that pertains solely to fabrication processes and to techniques for construction. Each action shown is subject to the requirements of the Contract Documents.
- C. The Engineer shall return the submittals to the Contractor for distribution.

++ END OF SECTION ++

SECTION 01300
SUBMITTALS

PART 1 - GENERAL

1.1 SCHEDULES

- A. The Contractor shall be responsible for preparing a progress or work schedule for the entire project.

1.2 SHOP DRAWINGS, SAMPLES AND MANUALS

- A. The Contractor shall process the Shop Drawings required by his Contract to the Engineer and he shall be responsible for their timely submission in accordance with the Shop Drawing schedule which is included in the overall progress or work schedule as described in this Section.
- B. Any proposed deviations or substitutions from that specified shall be clearly noted on the cover letter transmitting the shop drawing. Failure to so note will be cause for rejection of equipment, materials, etc. after installation.
- C. All submission shall be marked with the Specification Section Number containing the item submitted for review.
- D. Revised shop drawings submitted for review shall be marked "Resubmission".

1.3 SUBMITTAL PROCEDURES

- A. All submittals shall be delivered to the Engineer.
- B. The processed submittals will be returned to the Contractor.

PART 2 - SCHEDULE

2.1 PREPARATION

- A. The Contractor shall prepare a progress or work schedule for the entire project, showing the order in which the Contractor proposes to carry on his work and salient features, including submissions of shop drawings and samples and procurement of materials to meet date of completion. All other Prime Contractors and major subcontractors shall be consulted in the preparation of this Schedule and shall signify their approval of the finished Schedule by their signatures on it. Under no circumstance will the actual work begin on any contract until seven (7) calendar days after approval of the progress schedule by the Engineer.
- B. Each activity in the progress or work schedule shall be identified and a time for the performance of such activity indicated. Each activity shall be preceded by all work that must be accomplished prior to that activity. All abbreviations, codes and/or symbols used shall be described on the Schedule.

SECTION 01300

SUBMITTALS

- C. At least ten (10) days prior to submission of the first estimate for work completed, the Contractor must submit and have approved by the Engineer, a Detailed Estimate Form which will be provided by the Engineer. This form breaks each bid item into labor, materials, and other expense categories.

2.2 SUBMITTALS

- A. Submit six (6) copies of Schedule to the Engineer for review within thirty (20) days after award of Contract. Update and resubmit Schedule monthly thereafter until completion of the work. Updated Schedule shall have completed activities removed or indicated as such. Whenever modifications are made to the Contract which add or delete activities and/or revise time of completion, Schedule shall be revised and resubmitted to the Engineer within ten (10) days after such modification is authorized. Under no circumstances will any actual work begin on any contract until seven (7) calendar days after approval of the Progress Schedule by the Engineer.
- B. In the event that the work is behind schedule, the Schedule shall be revised, through the use of overtime work or by other means, to insure that the work is completed within the Contract time. Under these circumstances, overtime work shall be performed at no additional cost to the Owner.

PART 3 - SHOP DRAWINGS AND MANUALS

3.1 GENERAL

- A. Shop drawings are defined as drawings, diagrams, illustrations, schedules, performance charts, brochures and other data prepared by the Contractor which illustrate how specific portions of the work shall be fabricated and/or installed.
- B. Shop drawings are not part of the Contract Documents, but are a supplementary means of communications to assist in the understanding of what the Contractor proposes to provide and to establish that whatever he intends to install either does or does not conform to the Drawings and Specifications.
- C. In the instance of a request for a substituted item, the Contractor shall verify that it will fit into the space allocated to the originally required item giving due regard to all other trades' requirements. Where modifications to the Contract Documents are proposed, the Contractor must clearly indicate such deviation in writing in his transmittal letter. If the modification and/or substitutions are agreed to by the Engineer, the Contract Documents will be appropriately modified. However when additional work is required, the Contractor is advised that he must pay the Engineer for redesign to accommodate the revised substitution as well as pay other contractors for extra work required by them for the change. No increase in Owner's construction cost will be allowed.

SECTION 01300

SUBMITTALS

3.2 SUBMITTAL PROCEDURES

- A. All shop drawings shall be delivered to the Engineer.
- B. The Engineer will return the processed shop drawing submittals to the Prime Contractor.

3.3 CATALOG SHEETS

- A. For standard manufactured items considered by the Engineer as not requiring special Shop Drawings, Contractor shall submit four (4) copies of manufacturer's catalog sheets showing illustrated cuts of the items to be furnished, scale details, sizes, dimensions, performance characteristics, capacities, wiring and control diagrams and all other pertinent information.
- B. The Engineer will retain three (3) copies and return the third to the Prime Contractor submitting the catalog sheets.

3.4 SHOP DRAWINGS

- A. Each Prime Contractor will submit for review six (6) white prints of shop and working drawings of material fabricated especially for his Contract, and of equipment and materials for which such drawings are specifically requested.
- B. Prior to submitting drawings to the Engineer, the Prime Contractor shall check thoroughly all such drawings to satisfy himself that the subject matter conforms to the Plans and Specifications in all respects. Drawings which are correct shall be marked with the date, checker's name and certification of the Contractor's approval, and then shall be submitted to the Project Representative. Any Shop Drawings submitted without the Prime Contractor's certification will be returned without review.
- C. The Engineer will retain three (3) copies and return the remainder to the Prime Contractor.
- D. Shop Drawings shall show the principal dimensions, weight, structural and operating features, performance characteristics and wiring diagrams, space required, clearances, type and/or brand of finish or shop coat, grease fittings, etc., depending on the subject of the drawing. When it is customary to do so, when the dimensions are of particular importance or when so specified, the drawings shall be certified by the manufacturer or fabricator as correct for this Contract.
- E. When so specified or if considered by the Engineer to be acceptable, manufacturer's specifications, catalog data, descriptive matter, illustrations, etc., may be submitted for review in place of shop and working drawings. In such case the requirements shall be as specified for shop and working drawings, insofar as applicable.
- F. The Contractor shall be responsible for the prompt submission of all shop and working drawings in accordance with the shop drawing schedule so that there shall be no delay to the work due to the absence of such drawings.

SECTION 01300

SUBMITTALS

- G. No material shall be purchased or fabricated especially for this Contract until the required shop and working drawings have been submitted and reviewed as conforming to the Contract requirements. All materials and work involved in the construction shall then be as represented by said drawings.
- H. Only drawings which have been checked and corrected by the fabricator should be submitted to the Prime Contractor by his subcontractors and vendors. Prior to submitting drawings to the engineer, the Prime Contractor shall check thoroughly all such drawings to satisfy himself that the subject matter thereof conforms to the drawings and specifications in all respects. Drawings which are correct shall be marked with the date, checker's name and indication of the Prime Contractor's approval, and then shall be submitted to the Engineer; other drawings shall be returned for correction,
- I. The Engineer's review of shop and working drawings will follow a general check made to ascertain conformance with the design concept and functional result of the project and compliance with the information given in the Contract Documents. Each Prime Contractor is responsible for details and accuracy, for conforming and correlating all quantities and dimensions at the job site; for information that pertains solely to the fabrication process or to techniques of construction; and for coordination of the work of all trades.

3.5 MANUALS

- A. Each Prime Contractor shall be responsible for initially submitting to the Engineer two (2) copies of all requested operating and maintenance manuals with the shop drawing submittals.
- B. Six (6) complete sets of instructions, technical bulletins and other printed matter shall be furnished and delivered to the Engineer prior to installation of equipment.
- C. Prior to final payment, provide six (6) updated operating, maintenance manuals and parts lists for the Owner's use.

3.6 FIELD DISTRIBUTION

- A. Each Prime Contractor shall be responsible for the required number of processed drawings or catalog cuts for field distribution to all necessary Prime Contractors.
- B. Each Prime Contractor shall be responsible for the prompt distribution of processed shop drawings to all other Prime Contractors whose work must be coordinated with the work progress.
- C. The General Contractor shall have the overall responsibility for coordinating the necessary information to properly coordinate the work in accordance with Section 01010.

SECTION 01300

SUBMITTALS

PART 4 - SAMPLES

4.1 SUBMISSION OF SAMPLES

- A. Unless otherwise specified, each Prime Contractor shall provide samples in duplicate and identify each sample by an appropriate tag or label listing the names of the Project, the Owner, the Engineer and the Contractor and/or subcontractor as well as the exact identification of the samples. Tag or label shall be large enough to provide a blank space for review stamps.
- B. Samples of items submitted for destruction tests or for use in testing mixture with other materials will not be returned. Review of these items will be given by letter.
- C. When reviewed, one sample of each item, not submitted for destruction, will be returned to the Prime Contractor and shall be kept and maintained in good condition in the submitting Contractor's office at the project site for later use in comparison with material actually delivered for the work. When samples of large fabricated items or of costly items are required, reviewed samples may be installed in the work if the exact location of such samples is recorded on the Engineer's Record Drawings.

PART 5 - CERTIFICATIONS AND TESTS

5.1 GENERAL

- A. Two (2) copies of certifications and reports of tests when required under the various sections of the Specifications, shall be submitted.

PART 6 - CONSTRUCTION PHOTOGRAPHS

6.1 GENERAL

- A. The General Contractor shall provide clear, sharp, color photographs monthly, starting when the work begins and continuing as long as the work is in progress.
- B. Views shall be provided of the general construction area before any work begins, and subsequent views, indicating progress, shall be submitted to the Engineer each month in conjunction with the current Monthly Estimate. Photographs shall be 8 inches x 10 inches in size and shall be submitted in duplicate.
- C. A video of the entire area prior to construction and after construction will be acceptable in lieu of photographs in section 6.1.

6.2 NUMBER OF VIEWS

- A. Provide from five to ten views depending on the progress of the work.

SECTION 01300

SUBMITTALS

6.3 FINAL VIEWS

- A. After all construction work has been completed and the site has been graded and cleared of debris and equipment, the General Contractor shall take two aerial views in color of the completed construction. These will be the final photographs and the photographer shall consult with the Engineer regarding choice of views to be photographed.

++ END OF SECTION ++

SECTION 01500
TEMPORARY FACILITIES AND CONTROLS

PART 1 - MOBILIZATION

1.1 DESCRIPTION OF WORK

- A. Mobilization shall consist of initiating the Contract, and may include such portions of the following as are required at the beginning of the project:
 - 1. Setting up the Contractor's general plant, shops, storage areas and other facilities as may be required by the Specifications, by local or State law or by regulation.
 - 2. The Contractor obtaining the necessary permits and licenses, and payment of fees for same.
 - 3. Protecting existing utilities.
 - 4. Providing required insurance and bonds.
 - 5. Requirements of Part 2, Temporary Facilities and Controls, of this Section.

1.2 MATERIALS

- A. Materials under this part of this Specification are limited to those required for mobilization for the Contractor but not intended for incorporation in the complete Contracts.

1.3 EXECUTION

- A. All equipment required to diligently start the Contractor's construction work shall be on the site in satisfactory operating condition. The physical construction facilities including field office, personnel and equipment shall be set up and operating at the required efficiency to diligently pursue the work.

PART 2 - TEMPORARY CONTROLS

2.1 DESCRIPTION OF WORK

- A. Each Contractor and each interested Subcontractor and/or Vendor is referred to conditions and requirements given in various Divisions of the Specifications and to other Sections of this Division, General Requirements insofar as such documents affect the work of this Section.

2.2 OCCUPYING PRIVATE LAND

- A. Written consent from the proper parties shall be obtained by the Contractor prior to entering or occupying with men, tool, materials or equipment any land other than his property or that of the Owner for any purpose related to his performance of the work on this Contract

SECTION 01500
TEMPORARY FACILITIES AND CONTROLS

2.3 PROTECTION OF EXISTING UTILITIES

- A. Each Contractor shall conduct his operations and take all special precautions necessary to protect equipment, utility lines, roadways and subsurface, submerged and overhead facilities which are to remain in place and undisturbed by his operations under this Contract. The offending Contractor shall immediately notify the Owner of the facilities or areas which are disturbed, damaged or injured as a result of the Contractor's operations, and determine the proper method of replacing or repairing the affected facilities at least to the conditions which existed prior to the Contractor's operations. The offending Contractor shall, at his own expense, replace, repair or restore the affected facilities or areas to their original condition or shall reimburse the Owner of said facilities or areas for such expenses as the said Owner may accrue in performing the work, and the Contractor shall not be entitled to receive additional compensation under this Contract for such work.

2.4 INTERFERENCE WITH AND PROTECTION OF STREETS

- A. NO Contractor shall close or obstruct any portion of a street, road or private way without obtaining permits therefor from the proper authorities. If any street or private way shall be rendered unsafe by the Contractor's operations, he shall make such repairs or provide such temporary ways or guards as shall be acceptable to the Engineer.
- B. The Contractor shall assume full responsibility for the maintenance and restoration of those roadways within the construction area and also those roadways on which equipment must operate to reach the construction area.
- C. Street, roads, private ways and walks not closed shall be maintained passable by the Contractor at his expense, and the Contractor shall assume full responsibility for the adequacy and safety of provisions made.
- D. The Contractor shall, 48 hours in advance of closing any street, notify the police and fire departments in writing, with a copy to the Engineer. He shall cooperate with the police department in the establishment of alternate routes and, at his own expense, shall provide adequate, plainly marked detour signs. The signs shall be as required by the agency that has jurisdiction over the roadway.
- E. For the proper control of traffic, the Contractor shall provide an adequate number of persons employed at his own expense.

2.5 SAFETY PRECAUTIONS

- A. Until final acceptance of the work under this Contract, each Contractor shall continuously maintain adequate protection, of his work and work in progress from damage, and shall protect from loss or damage machinery, equipment, materials and supplies being handled, from loss or damage arising out of or in connection with the prosecution of his work. He shall make good any such loss or damage. He shall adequately protect adjacent private and public property as provided by law and the Contract Documents.

SECTION 01500

TEMPORARY FACILITIES AND CONTROLS

- B. No Contractor shall load or permit any part of any structure to be loaded with a weight that would endanger its safety and it shall be the Contractor's responsibility to verify the acceptable load carrying capacity of any structure his equipment or work will effect, unless the load carrying capacity is so stated by the Engineer.
- C. The Contractor shall immediately report in writing, giving full details, to the Owner all accidents which arise out of or in connection with the performance of the work, whether on or adjacent to the site, which cause death, serious personal injury or substantial property damage. In addition, the accident shall be reported immediately by the telephone or messenger to the Engineer. If a claim is made or suit is filed by anyone against the Contractor on account of any accident, the Contractor shall promptly report the facts in writing to the Engineer, with a copy to the Owner, giving full details of the claim.
- D. The Contractor shall assume all risks of loss or damage of any kind to any vehicles, machinery, equipment, materials or supplies which he shall provide in doing the work.
- E. The Contractor shall conduct his work in such a manner as to adequately protect property owned by others on or about the Owner's premises from damage by the construction operations.
- F. Each Contractor shall provide protection of his work from freezing and from other elements which would be harmful to it. The General Contractor shall furnish heat or protective shelters or temporary building as required for the prosecution and protection of all the work.
- G. Each Contractor shall take all necessary precautions for the safety of employees on the work, and shall comply with all applicable provisions of federal, state and local safety laws and building codes to prevent accidents or injury to persons on, about or adjacent to the premises where the work is being performed. He shall erect and properly maintain at all times as required by the conditions and progress of the work, all necessary safeguards and barricades for the protection of employees on the work and the safety of others employed near the work and public, and shall post danger signs and warning lights warning against the hazards created by such features of the construction as protruding nails, hoists, excavations, elevator hatchways, scaffolding, window openings, stairways and falling materials. He shall designate a responsible member of its organization on the work, whose duty shall be the prevention of accidents. The name and position of the person so designated shall be reported in writing to the Engineer with a copy to the Owner.

2.6 DUST CONTROL

- A. During the progress of the work, the Contractor shall conduct his operations and maintain the area of his activities so as to minimize the creation and dispersion of dust. If the Engineer decides that it is necessary to use calcium chloride for more effective dust control, the General Contractor shall furnish the material, load, deliver, and spread it as authorized.

SECTION 01500
TEMPORARY FACILITIES AND CONTROLS

PART 3 - TEMPORARY FACILITIES

3.1 SANITARY

- A. The Contractor shall provide, maintain and remove when no longer required, an adequate number of temporary, prefabricated, chemical-type toilets with proper enclosures for the use of workmen and women of all trades during construction. Locate toilets where directed. When connected to water and sewer, meet all code requirement and take precautions to prevent freezing.
- B. The Contractor shall keep toilets clean and supplied with toilet paper at all times. Comply with all local and state health requirements and sanitary regulations. The Contractor shall obtain all necessary permits from the Municipality's Zoning Officer for provisions of portable toilets

3.2 WATER

- A. The Contractor shall make necessary arrangements and supply all water required during entire construction period. Provide suitable drinking water for all workers on the Project.
- B. Installer of temporary service shall remove same when no longer required.

3.3 ELECTRICITY

- A. The Contractor shall make necessary arrangements and supply and pay for all temporary electric service and lighting required during the entire construction period. Temporary electric service shall be of sufficient capacity and characteristics to supply proper current for various types of construction tools, motors, lights, pumps and other items required.
- B. Each Contractor shall make provision to meter electricity required for his temporary office facilities and storage sheds.

3.4 SECURITY

- A. The General Contractor shall provide and pay for an adequate level of security protection to protect the property and material of the Owner, and all Contractors from pilferage, removal or damage at all times.

3.5 OFFICES AND STORAGE

- A. Each Contractor shall, for his own use, provide and maintain such temporary office facilities as he may require and such watertight storage sheds with floors as may be required for storage of his materials which might be damaged by weather. The General Contractor shall allocate suitable space for office and storage for each Contractor and Subcontractor within the area indicated on the Plans subject to the acceptance of the Engineer.

SECTION 01500

TEMPORARY FACILITIES AND CONTROLS

- B. Materials stored in the open at the Project site shall be stored on planks or other dunnage as necessary to keep materials from contact with the ground and shall be covered with tarpaulins for protection from weather.
- C. All temporary offices and storage facilities shall be removed by their installer when no longer required.

++ END OF SECTION ++

SECTION 01620
PRODUCT DELIVERY, STORAGE & PROTECTION

PART I - GENERAL

1.1 APPLICABILITY

- A. This Section applies to all products furnished under this Agreement. Shipments of equipment or materials to be used by the Contractor or its subcontractors shall be delivered to the site only during regular working hours. All shipping papers and shipments shall be addressed and consigned to the Contractor giving the name of the Project with address. Under no circumstances will Owner accept shipments directed to it or the Engineer unless otherwise specified.

1.2 DELIVERY

- A. Products shall not be delivered to the Owner or the Engineer.
- B. Products shall not be delivered to the project site until related shop drawings have been reviewed by the Engineer.
- C. Products shall not be delivered to the project site until appropriate storage facilities are in place.
- D. Products shall be delivered to the site in manufacturer's original, unopened, labeled containers.
- E. The Contractor shall not drop, roll or skid products off delivery vehicles. Hand carry or use suitable materials-handling equipment.
- F. The Contractor is responsible for receiving, unloading, freight and demurrage of products.

1.3 STORAGE AND PROTECTION

- A. General:
 - 1. The Contractor shall store and protect products in accordance with the manufacturer's recommendations and the requirements specified herein. No on-site existing storage facilities are available for use by the Contractor. All on-site facilities for storage shall be furnished by the Contractor.
 - 2. The Contractor shall not block or restrict the use of public rights-of-way, access roads or private property with stored materials.
 - 3. The Contractor shall not store products where they will interfere with operations of the owner or other contractors.
 - 4. The Contractor shall protect all products from damage or deterioration by weather.
 - 5. The Contractor shall not store any products directly on the ground.

SECTION 01620

PRODUCT DELIVERY, STORAGE & PROTECTION

6. The Contractor shall not store any products in drainage ditches or areas where water may stand.
7. The Contractor shall label containers to identify materials inside using the terminology found in these Specifications.

B. Uncovered Storage:

1. The following types of materials may be stored out of doors without cover:
 - a. Masonry units
 - b. Reinforcing steel
 - c. Piping
 - d. Precast concrete items
 - e. Castings
2. The above mentioned materials shall be stored on wood blocking.

C. Covered Storage:

1. The following types of materials may be stored out of doors if covered with material impervious to water: Rough Lumber
2. The Contractor shall tie down covers with rope and slope to prevent accumulation of water on covers.
3. The Contractor shall store materials on wood blocking.

D. Fully Protected Storage:

1. The Contractor shall store all products not named above in buildings or trailers which have a concrete or wooden floor, a roof, and fully enclosed walls on all sides.
2. The Contractor shall provide heated storage space for materials which would be damaged by freezing.
3. The Contractor shall protect mechanical and electrical equipment from being contaminated by dust and dirt.
4. The Contractor shall maintain temperature and humidity at levels recommended by manufacturers for electrical and electronic equipment.

++ END OF SECTION ++

SECTION 01700
PROJECT CLOSE-OUT

PART 1 - GENERAL

1.1 SCOPE

- A. This Section describes an orderly and efficient transfer of the completed work to the Owner.

1.2 QUALITY ASSURANCE

- A. Prior to requesting inspection by the Engineer, the Contractor shall use adequate means to assure that the Work is completed in accordance with the specified requirements and is ready for the requested inspection.

PART 2 - CLOSE OUT

2.1 CLEANING

- A. The Contractor shall perform final cleaning. In addition to the requirements in the General Conditions, the contractor shall perform the following:
- B. Final cleaning of construction facilities shall be performed after the work is completed and immediately before turning the work over to the Owner.
- C. Cleaning materials shall be free from harmful abrasives and shall be acceptable to the manufacturers of the materials on which they are used.
- D. The Contractor shall remove all his field offices, storage facilities, and any other materials or items that were used by him during the construction and not incorporated into the Project. The Contractor shall leave these temporary service areas in a clean condition and repair or replace any damaged areas ready to be turned over to the Owner. The Contractor shall seed and sod as required.

2.2 FINAL RESTORATION

- A. In addition to the requirements specified in the various Sections of these Specifications, the Contractor shall make final restoration of all areas disturbed by his temporary construction facilities such as, but not limited to, office and storage trailers.
- B. In general, the Contractor shall repair all walks, roadways and any other areas damaged during construction, inside or outside the Construction zone, to the satisfaction of the Owner.

2.3 RECORD DRAWINGS

- A. In addition to the prints furnished for construction and for public bodies, the Contractor will be furnished without charge, one set of White Prints for the purpose of recording as-built conditions.

SECTION 01700
PROJECT CLOSE-OUT

- B. These prints shall be marked as "Record Drawings" and maintained at the Project site. The Contractor shall record on the prints all deviations from the Contract Drawings, at the time that such deviations are made.
1. Record Plans shall show all vertical and horizontal changes to the dimensions as shown on the Drawings. Drawings shall indicate a profile showing the depths where rock was encountered and all other changes made to the Contract Drawings. The Resident Inspector shall provide the Contractor with a sample "Record Drawings" at the time of construction.
 2. A complete file of accepted field sketches, diagrams, and other changes as may become necessary during the progress of the work shall also be maintained and attached to the set of marked-up prints.
 3. For each progress payment submission the Contractor shall provide evidence to the satisfaction of the Engineer that all changes to date have been incorporated into the Contractor's "Record Drawings".
 4. At completion of the work, the Contractor shall provide, for the information of the Engineer, one set of each sheet of marked up prints and all accepted field sketches and diagrams.
 5. When this data has been checked and returned by the Engineer, the Contractor shall record all field changes and conditions on the "Record Drawings". Each sheet of these "Record Drawings" shall be signed by an Officer of the company certifying that each sheet reflects the as-built conditions.
 6. Before final payment for this close-out item, deliver "Record Drawings" in a clean and neat condition to the Engineer.

++END OF SECTION++

DIVISION 2

SITEWORK

SECTION 02100
SITE PREPARATION

PART 1 - GENERAL

1.1 SCOPE

A. Description of Work

1. Provide all labor, material and equipment to perform all clearing and grubbing as shown on the Drawings and as specified herein.
2. Protect trees, landscaping, site improvements, and other item scheduled for clearing, or that might be damaged by construction activities.
3. Strip topsoil and stockpile at approved location on-site.
4. Provide erosion and sediment control.
5. Do not disturb benchmarks or monuments.

B. Related Work Specified Elsewhere

1. Section 02110, EROSION AND SEDIMENT CONTROL PLAN
2. Section 02200, EARTHWORK

1.2 PROTECTION

A. Streets, roads, adjacent property and other works to remain shall be protected throughout the work as defined in the General Conditions.

B. Existing trees, shrubs and bushes

1. Trees shall be protected by fencing, barricades, or wrapping as may be required.
2. Shrubs and bushes shall be protected by fences or barricades as may be required.
3. Shallow-rooted plants shall be protected at ground surface under and in some cases outside the spread of branches by fences, barricades, or ground cover protection as may be required.

1.3 REQUIREMENTS OF REGULATORY AGENCIES

A. Federal, state and local laws and code requirements shall control the disposal of trees and shrubs.

SECTION 02100
SITE PREPARATION

PART 2 - PRODUCTS

2.1 MATERIALS - GENERAL

- A. Materials shall be at the Contractor's option.
- B. Present on site materials excavated in the course of construction which are deemed suitable by the Engineer may be stored on the site for use as back-fill.

PART 3 - EXECUTION

3.1 GENERAL DESCRIPTION

- A. All operations must be confined to the area of the Rights-of-Way of the Owner. All damage done to property resulting from the Contractor's negligence shall be repaired without charge to the satisfaction of the owner with the exception of those items (trees, shrubs, etc.) that must be removed for construction and have been agreed upon beforehand, in writing, between the Contractor and the Owner.

3.2 CLEARING

- A. Limits of clearing shall be within the area of construction limits shown on the Drawings or to limits staked on the ground by the Engineer.
- B. Trees in construction zones shall not be removed until inspected and/or tagged by the Owner or his representative.
 - I. No trees shall be removed within the construction zone except the following:
 - a. Trees within an excavated area such as footings or trench.
 - b. Trees whose root system will be destroyed by the excavation.
 - c. Trees that interfere with the movement of the Contractor's equipment with the approval of the Engineer. Any trees that interfere with the movement of the Contractor's equipment shall be reviewed by the Engineer before they are removed.
- C. All trees bordering any construction zone shall be protected by acceptable methods. Trees damaged by the Contractor will be either repaired or replaced as determined by the owner or his representative at the Contractor's expense.
- D. Vegetation within the areas to be cleared, which may be designated to be saved by the Owner shall be left standing and uninjured.
- E. Remove trees, saplings, shrubs, bushes, vines and undergrowth within the limits of clearing to the heights above ground given in the following table:

SECTION 02100
SITE PREPARATION

- | | | |
|----|--|-----------|
| 1. | Trees over six inches in diameter: | 12 inches |
| 2. | Shrubs, saplings, bushes, and trees
under six inches in diameter: | 3 inches |
| 3. | Vines and undergrowth: | 2 inches |

F. Stumps

1. Stumps required to be removed shall be to a depth of 18 inches. This depth shall be measured from the existing ground surface or the proposed finished grade, whichever is the lower.
2. Engineering requirements shall control removal of stumps under fills, foundations, or any construction in contact with the stumps.
3. Stumps must be removed from the job site. No burning is permitted.

3.3 GRUBBING

- A. Limits of grubbing shall coincide with the limits of clearing.
- B. Remove all stumps, roots over 4-inches in diameter, and matted roots within the limits of grubbing to a depth of 18 inches, measured from the existing ground surface or the proposed finish grade, whichever is lower.

3.4 TRIMMING OF TREES

- A. When required, with the owner's approval, trees shall be trimmed to remove branches or roots which interfere with construction or traffic. Paint all cut branches and roots with wound paint as recommended for the application.

3.5 SALVAGE

- A. Material which is to be salvaged, as a result of the clearing operations, shall include the following items which are to be turned over to the property owner if the property owner so desires.
 1. Logs over 12 inches, butt diameter.
 2. Branches over 6 inches, butt diameter.
 3. Parts suitable for use as mulch.
 4. Live plants suitable for replanting.
- B. All salvageable material not desired by the property owner shall be removed as part of the work.

SECTION 02100
SITE PREPARATION

3.6 DISPOSAL

- A. Burning of materials on site will not be permitted.
- B. Material to be removed shall be removed from the site daily as it accumulates.
- C. Should the Contractor elect to continue work beyond normal working hours, material to be removed shall not be allowed to accumulate for more than 48 hours.
- D. Prior to depositing surplus material at any off-site location, the Contractor shall obtain a written agreement between himself and the owner of the property on which the disposal is proposed. The agreement shall state that the owner of the property gives permission for the Contractor to enter and deposit the material at no expense to the project Owner. A copy of the agreement shall be furnished to the Owner. Contractor's disposal shall comply with all Federal, State, and Local laws and regulations.

++END OF SECTION++

SECTION 02110
EROSION AND SEDIMENT CONTROL PLAN

PART 1 - GENERAL

1.1 INTENT

A. Governmental Requirements

1. The Contractor shall be responsible to comply with all aspects of 327 IAC 15-5, Rule 5, "Storm Water Run-Off Associated with Construction Activity". The Contractor shall submit all necessary fees and documents to the Indiana Department of Environmental Management (IDEM) prior to any construction activity. The Contractor shall be responsible for compliance with this Law throughout the construction period and shall pay any and all fines resulting from any violation, suit or penalty for noncompliance.

B. Goal

1. The goal of this plan is to minimize stream sediment pollution caused by erosion from areas disturbed by the Contractor's operations.

C. Implementation

1. It shall be the responsibility of the Contractor to implement this plan in the field and meet all applicable regulations. The Contractor shall assign this responsibility to a person experienced in sediment and erosion control procedures. Modifications or deviations from this plan will be allowed only if the Contractor first obtains written permission from IDEM and the local Conservation District.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 02100, SITE PREPARATION
- B. Section 02200, EARTHWORK
- C. Section 02820, RESTORATION OF DISTURBED AREAS.

1.3 APPLICABLE STANDARDS

A. Erosion and Sediment Pollution Control Program Manual

1. Indiana Handbook for Erosion Control in Developing Areas. Copies are available from the Indiana Department of Environmental Management, Office of Water Management, Storm Water Group, Permits Section, PO Box 6015, Indianapolis. IN 46204-6015, Phone (317) 232-8704.

SECTION 02110
EROSION AND SEDIMENT CONTROL PLAN

1.4 STANDARD CONDITIONS RELATING TO IDEM WATER QUALITY MANAGEMENT PERMITS

- A. The Contractor shall familiarize himself and shall be responsible for carrying out all requirements stated in the Standard Conditions Relating to Erosion Control which are attached to the IDEM Water Quality Management Permit issued to the Owner for the construction of this project.
- B. A forty-eight (48) hour written notice shall be given to the LaGrange County Conservation District, with a copy forwarded to the Owner and Engineer.
- C. Particular attention shall be given to areas of steep topography and highly erodible soils. Cleared areas shall be kept to a minimum and to the shortest practical distance ahead of construction.

PART 2 - MATERIALS

2.1 GENERAL

- A. All products and materials shall meet the requirements of the local soil conservation district or as specified elsewhere in these Specifications.

PART 3 - EXECUTION

3.1 PLANNING OF CONSTRUCTION

- A. Planning and coordination of the construction is needed to reduce sediment pollution. Accurate planning shall be used to minimize the area of disturbance. The cleared area must be kept to the minimum which will facilitate the construction.
- B. Restoration work shall be done as the project progresses and not be left until the end of the project. No areas shall be left unprotected for more than 20 days.
- C. All areas on which final grading is completed after October 15th must be protected by a well anchored mulch until the spring, when effective seeding or planting can be undertaken.

3.2 TRAFFIC CONTROL

- A. Minimization of the area of disturbance also involves traffic control. Corridors for equipment travel shall be established to protect those areas that will not be denuded. Instructions shall be issued that routes for convenience shall not be allowed and that established equipment travel corridors must be used. These instructions must be enforced. Traffic shall be kept to an absolute minimum. Delivery of material will be required and this traffic shall enter and leave on a designated access route. Passenger vehicle traffic shall be discouraged. Workmen shall walk from the designated contractor parking rather than drive and they shall park on

SECTION 02110
EROSION AND SEDIMENT CONTROL PLAN

stabilized areas whenever possible. The filtering of sediment-laden runoff by vegetation is an important measure in the reduction of sediment delivered to downstream areas and it must be preserved. Indiscriminate and convenience travel shall not be allowed to destroy these natural filter areas.

3.3 EROSION AND SEDIMENT CONTROL MEASURES

A. Stabilized Construction Entrance

1. At all locations where construction will enter paved roads from unpaved areas, a stabilized construction entrance shall be provided to prevent the tracking or flow of sediment onto paved areas. Construction entrances shall be installed and maintained according to the specifications in the IDEM Erosion and Sediment Pollution Control Program Manual. See "Stabilized Construction Entrance" detail.

B. Silt Fence

1. **Materials**
 - a. Geotextile fabric fence materials for construction of a vertical sediment control fence shall be only those fabric types specified for such use by the manufacturer. The fabric shall be "Mirafi Envirofence" as manufactured by Mirafi Inc., Division of Nicolon Corporation, Norcross, GA or approved equal product by other manufacturer.
 - b. The silt fence shall be installed and maintained according to the requirements of the IDEM Erosion and Sediment Pollution Control Program Manual.
2. This sediment barrier is designed for situations in which only sheet or overland flows are expected.
 - a. The height of a silt fence shall not exceed 36 inches (higher fences may impound volumes of water sufficient to cause failure of the structure.)
 - b. The filter fabric shall be purchased in a continuous roll cut to the length of the barrier to avoid the use of joints. When joints are necessary, filter cloth shall be spliced together only at a support post, with a minimum 6-inch overlap, and securely sealed.
 - c. Posts shall be spaced a maximum of 8 feet apart at the barrier location and driven securely into the ground (minimum of 18 inches).
 - d. A trench shall be excavated approximately 6 inches wide and 6 inches deep along the line of posts and upslope from the barrier with little, if any, disturbance to the downslope side of the trench.
 - e. Filter fabric shall not be stapled to existing trees.

SECTION 02110
EROSION AND SEDIMENT CONTROL PLAN

- f. The trench shall be backfilled and the soil compacted over the filter fabric.
 - g. Silt fences shall be removed when they have served their useful purpose, but not before the upslope area has been permanently stabilized.
- D. Earth Slope Protection
 - 1. Earth slopes shall be protected from accelerated erosion as soon as possible after the cut or fill operation. This shall be done by quick establishment of vegetative cover (temporary and/or permanent), mulches, providing jute matting or synthetic netting on steeper slopes or a combination of the above.
- E. Preservation of Existing Vegetation
 - 1. Good stands of existing vegetation adequate to control erosion should be preserved wherever possible. Regeneration of wood plants should be encouraged where acceptable. New vegetation, soil treatments, etc. shall be done as specified on the drawings and in the applicable sections of these specifications.

3.4 EXCAVATION AND BACKFILL

- A. Excavation for construction operations shall be closely controlled. The material removed from the excavation shall be selectively stockpiled in areas where a minimum of sediment will be generated and where other damage will not result from the piled earth. Drainage ways shall be protected at all times and the piling of soil in drainage ways will not be allowed. Backfilling operations shall be performed in such a manner that remaining trees are not damaged.

3.5 STREAM PROTECTION

- A. Where construction is close to existing streams and other waterways, construction shall be performed in a manner which will not contribute to stream pollution. Construction practices shall include the following:
 - 1. Construction debris, excavated materials, brush, rocks, refuse, and topsoil shall be kept as distant from the stream as is possible.
 - 2. Stream crossings and machinery operation in streams is prohibited. Under no circumstances will a stream bed be permitted to become a highway for machinery traffic.
 - 3. There shall be no change in preconstruction contours except where noted on the plans (excess material must be removed to an upland disposal area).
 - 4. The discharge of dredged or fill material shall not jeopardize a threatened or endangered species as identified under the Endangered Species Act, or destroy or adversely modify the critical habitat of such species.

SECTION 02110
EROSION AND SEDIMENT CONTROL PLAN

5. The discharge of dredged or fill material shall consist of suitable material free from toxic pollutants in toxic amounts.
6. The fill created by the discharge of dredged or fill material shall be properly maintained to prevent erosion and other non-point sources of pollution.
7. The discharge of dredged or fill material shall not occur in a component of the National Wild and Scenic Rivers System in a component of a State Wild and Scenic River System, nor in a river officially designated by Congress as a "study river" for possible inclusion in the system, while the river is in an official study status.
8. The discharge of dredged or fill material shall not be located in the proximity of a public water supply intake.
9. The discharge of dredged or fill material shall not occur in areas of concentrated shellfish production.
10. The discharge of dredged or fill material shall not significantly disrupt the movement of those species of aquatic life indigenous to the waterbody.
11. The discharge of dredged or fill material shall not cause an unacceptable interference with navigation.
12. The discharge of dredged or fill material shall not impair reserved tribal rights, including, but not limited to, reserved water rights and treaty fishing and hunting rights.
13. The discharge of dredged or fill material into waters of the United States shall be avoided or minimized through the use of other practical alternatives.
14. Discharges in spawning areas during spawning season shall be avoided.
15. Mats, pads, or other similar devices shall be used where crossings of wetland areas by construction equipment cannot be avoided.
16. Discharges into breeding and nesting areas for migratory waterfowl shall be avoided.
17. All temporary fills shall be removed in their entirety.
18. Discharges in wetlands areas outside the project limits shall be avoided.
19. Discharges shall not restrict or impede the movement of aquatic species indigenous to the waters or the passage of normal or expected high flows or cause the relocation of the water.

SECTION 02110
EROSION AND SEDIMENT CONTROL PLAN

20. If the discharge creates an impoundment of water, adverse impacts on the aquatic system caused by the accelerated passage of water and/or the restriction of its flow shall be minimized.
21. During construction activities, all public and private property including existing vegetation, landscape features and monuments within, along and adjacent to the work area, shall be protected and preserved to the maximum degree possible. This shall include, but not be limited to, precautions taken to minimize damage, erosion, injury, or destruction; prevent pollution; provide protection of all trees and other woody plants; special care being taken to protect the natural vegetation and surroundings to include all natural drainage ways, ponds, lakes, swamps, woods and fields; and storage of materials in such manner to prevent leaching which would be injurious to soils and to plants. Precautions should be taken to prevent damage to pipes, conduits and other underground structures.
22. Archaeological artifacts discovered during the performance of work must be adequately protected and their discovery promptly reported to the Director, Bureau of Historic Preservation, Historical and Museum Commission.
23. Deposition of dredged or excavated materials and all earthwork operations will be carried out in such a way as to minimize erosion of the material and preclude its entering into any wetland outside of the project area.

3.6 STOCKPILES

- A. All stripped topsoil and excavated earthen material to be used within the project site shall be properly stockpiled. Stockpile areas shall be selected and maintained by Contractor's on-site personnel. Site selections and stockpile design shall incorporate sediment and erosion control facilities to prevent the potential direct production and delivery of sediment to waterways, damage to vegetation, and the unnecessary destruction of trees that are selected for preservation. Temporary or interim stabilization of soil stockpiles shall be promptly instituted. All soil that is to be stockpiled for a period of greater than 20 calendar days shall be temporarily stabilized. The existence of critical slopes on stockpiles shall be avoided. Stockpiling in or immediately adjacent to diversion channels will not be allowed because the stockpiled material may provide a direct and high volume source of sediment due to storm runoff. Structural practices shall be installed on large stockpiles. Their design and implementation shall be accomplished by competent on-site personnel.
- B. Temporary vegetative measures planned for implementation on stockpile areas shall be established immediately after the stockpile operation is completed. Proper mulching and soil stabilization in conjunction with seeding operations shall also be carried out.

3.7 MAINTENANCE

- A. Periodic inspections shall be made weekly and after every storm event to detect any impairment in the ability of the erosion and sediment control facilities installed as part of this plan to continue to function effectively. This includes, but is not limited to, the repair of the

SECTION 02110
EROSION AND SEDIMENT CONTROL PLAN

basin or diversion berms if required, replacement of silt fences or stone filtering systems if necessary.

- B. Vegetative practices require maintenance. A fertilization and reseeding program shall be established and carried out as the construction proceeds. Areas where failures have been experienced in the establishment of both permanent and temporary vegetative protection shall be promptly treated. The reestablishment of permanent vegetative cover shall be initiated as soon as possible in an effort to keep the area requiring maintenance work to a minimum.
- C. Information shall be distributed to all persons on the construction site describing and stressing the importance of the proper installation and maintenance of the erosion and sediment control procedures included in this plan. The actions and language of supervisors on the project shall continually emphasize the seriousness and importance of sound erosion and sediment control procedures.

++END OF SECTION++

SECTION 02200
EARTHWORK

PART 1 - GENERAL

1.1 SCOPE

A. Description of Work

1. The Contractor shall perform work necessary pertaining to earthwork as shown on the Drawings and as specified herein. This work will also include hauling on-site soil during construction and importing other fill necessary for the earth-moving construction.
2. All work performed and materials furnished shall conform to the lines, grades, cross-sections, dimensions, details, gradation and physical requirements indicated on the Drawings and as called for in the Specifications. All earthwork performed and materials furnished shall be items of controlled inspection by the Engineer.
3. All excavation is unclassified.

B. Related Work Specified Elsewhere

1. Section 01500, TEMPORARY FACILITIES AND CONTROLS.
2. Section 02100, SITE PREPARATION
3. Section 02110, EROSION AND SEDIMENT CONTROL

1.2 SUBMITTALS

- A.** Ten (10) days before beginning any earthwork, the General Contractor shall submit to the Engineer the following in accordance with Section 01300:
1. Location of source(s) for all types of fill materials.
 2. Numbers and types of compacting equipment to be used.
 3. Starting date of earthwork operations.
- B.** The General Contractor shall submit to the testing laboratory specified by the Engineer for testing and review one 100 pound representative bag sample of each kind of fill material at least ten (10) days prior to fill or backfill operations. By submitting samples of these materials, the Contractor agrees and guarantees that fill materials actually used in the construction will conform to the accepted samples submitted.

1.3 LINES AND ELEVATIONS

- A.** Elevations

SECTION 02200

EARTHWORK

1. Grades throughout each wetland system shall be true to the elevations shown on the Drawings. Work not conforming to these elevation shall be corrected by the Contractor at the Contractor's expense.
 2. Pipes shall be laid true to the lines and elevations shown on the Drawings. Work not conforming to the elevation shall be corrected by the Contractor at the Contractor's expense.
- B. Changes in Location or Elevation
1. The Owner will allow no claims for changes in locations or elevations unless such changes are made after trenching has been done. In such cases, the compensation will be determined in accordance with the GENERAL CONDITIONS, and if the Contractor fails to promptly notify the Engineer at the time of the change in accordance with the GENERAL CONDITIONS, the Contractor shall waive rights for claims in accordance with the GENERAL CONDITIONS.

1.4 SAFETY REQUIREMENTS

- A. Provide and maintain barricades, signs, lights, etc. as required to protect the public.
- B. Excavation Near Existing Structures
1. Excavation near structures or other improvements will not be allowed closer to the structure than the depth of the excavation below the existing structure foundation plus two (2) feet without shoring the excavation with sheeting.
- C. Underground Utilities
1. Attention is directed to the fact that there may be water pipes, drains, sewer lines and other utilities in certain locations. Some of these have been indicated on the Drawings, but no attempt has been made to show all of the services, and the completeness or accuracy of the information given is not guaranteed.
- D. Mud, Dirt and Debris
1. During the progress of the work, the Contractor shall conduct operations and maintain the area of activity so as to minimize the creation and dispersion of dust.
 2. The Contractor shall maintain existing access roads and facilities free of mud, dirt and debris.

1.5 CARE AND RESTORATION OF PROPERTY

- A. Excavating machinery shall be operated with care to prevent damage to existing structures and/or wires.

SECTION 02200

EARTHWORK

- B. On paved surfaces, the Contractor shall not use or operate tractors, bulldozers, or other power operated equipment.
- C. All surfaces which have been damaged by the Contractor's operations shall be restored to a condition at least equal to that in which they were found immediately prior to the beginning of operations. Suitable materials and methods shall be used for such restoration.
- D. The restoration of existing property or structures shall be done as soon as possible and shall not be left until the end of the construction period.
- E. All work shall conform to the above and to Section 02820 of these specifications.

PART 2 - PRODUCTS

2.1 MATERIALS - GENERAL

- A. Materials used for fill shall be foreign materials brought to the site from acceptable sources or present on site materials excavated in the course of construction which are deemed suitable by the Engineer.
- B. All material, whether from the excavations or from borrow, shall be of such nature that after it has been placed and properly compacted, it will make a dense, stable fill. It shall not contain vegetation, cinders, ashes, refuse, masses of roots, stones larger than sizes allowed in the following paragraph, or porous matter. Organic matter shall not exceed minor quantities and shall be well distributed.

2.2 SUITABLE MATERIALS

- A. General
 - 1. Suitable material, when used as backfill, shall be capable of being compacted as specified in Placement and Compaction of this Section of these Specifications.
 - 2. Timber, logs, brush, rubbish, rocks, stumps and vegetative matter which will interfere with the spreading operation or affect the planned stability of the basin embankments shall be removed and disposed of off-site.

2.3 STRUCTURAL FILL

- A. Structural fill shall consist of inorganic soil with rock fragments no larger than three (3) inches. The moisture content of the fill materials should be controlled to within three (3) percent of the optimum by wetting, aeration, or blending to facilitate compaction. Structural fill may be material excavated from on-site or may be imported material. Structural fill shall meet the following gradation requirements:

SECTION 02200
EARTHWORK

<u>U.S. Sieve Size</u>	<u>Percent Passing</u>
1 ½ inch	100
1 Inch	95 - 100
½ Inch	25 - 60
No. 4	0 - 10
No. 8	0 - 5

- B. Soil imported to the site for use in constructing the detention embankments shall meet the above requirements for structural fill.
- C. Materials excavated in the course of construction, meeting the above requirements, may be used for structural fill.

2.4 GENERAL FILL

- A. General fill shall consist of material excavated from the site or materials from other sources which are free from large clods, roots, or stones larger than 6 inches. General fill shall meet the following gradation requirements:

<u>U.S. Sieve Size</u>	<u>Percent Passing</u>
2 ½ inch	100
2 Inch	80 - 100
3/8 Inch	70 - 100
No. 10	50 - 100
No. 30	30 - 85
No. 60	15 - 65
No. 200	5 - 15

- B. General fill may be used for site grading.
- C. Materials excavated in the course of construction, meeting the above requirements, may be used for site grading.

2.5 CRUSHED STONE

- A. Crushed stone for pipe bedding shall meet the gradation shown on table below, not washed, with fines present to stabilize it in the trench. If amount of fines is insufficient, then stone screenings shall be added to extent required to stabilize it in the trench.

<u>Crushed Stone Square Mesh Sieve Size</u>	<u>Percent Passing by Weight</u>
1 inch	100
¾ inch	52 - 100
⅜ inch	36 - 70
No. 4	24 - 50
No. 16	10 - 30
No. 200	0 - 10

SECTION 02200

EARTHWORK

- B. Sharp stones and crushed rock (larger than 3/4 in.) shall be excluded from the bedding material.

2.6 TOPSOIL

- A. Topsoil shall be designated as Class A (imported), Class B (selected), or Class C (unclassified).
- B. Class A topsoil shall be from a source outside the limits of the project selected by the Contractor and in compliance with the requirements specified herein. Class A topsoil shall have the same relative composition and structure, a friable sandy loam character, and be free of roots, clods, and stones larger than 1-inch in greatest dimension, pockets of coarse sand, noxious weeds, sticks, brush and other litter. It shall not be infested with nematodes or other undesirable insects and plant disease organisms and meet the following additional requirements:
 - 1. Gradation limits: Sand, 50-80 percent, clay 20 percent maximum, and silt, 30 percent maximum. The sand, clay and silt gradation limits shall be as defined in ASTM D 422.
 - 2. Permeability Rate: Not less than 0.5 inches per hour nor more than 2 inches per hour when tested in accordance with ASTM D 2434, Calif. Test 220, or other approved methods.
 - 3. Agricultural Suitability. The topsoil shall be suitable to sustain the growth of the plants specified.
- C. Class B topsoil is selected material which is obtained from sources within or outside of the project limits.
- D. Topsoil for wetland areas shall be as specified in Section 02240, Ground Preparation for Wetland Planting.
- E. Topsoil shall not be delivered to the site in frozen or muddy condition.

PART 3 - EXECUTION

3.1 GENERAL DESCRIPTION

- A. The Contractor shall not initiate any earth disturbance until the approved Erosion and Sediment Control Plan has been implemented.
- B. The Contractor shall make all excavations in such manner and to such widths as will give suitable room for building the constructed wetlands. The Contractor shall follow the Sequence of Construction included in the approved Erosion and Sediment Control Plan. The

SECTION 02200

EARTHWORK

earthwork shall be constructed by cutting and filling existing on-site and imported soil at the locations and to the contours shown on the Drawings.

- C. The Contractor shall be solely responsible for the stability of excavations and embankments for the duration of the Contract Time; and shall provide all sheeting, shoring, bracing, etc., required to retain excavations and embankments.
- D. The excavation, dewatering, sheeting, and bracing shall be carried out in such manner as to eliminate any possibility of undermining or disturbing the foundations of any existing structure and other improvements or any work previously completed under this Contract.
- E. Where damage is liable to result from withdrawing sheeting, the sheeting shall be left in place. Sheeting shall be left in place only when agreed to or requested by the Engineer.
- F. Excavated, unsuitable and excess material can be disposed of at a location approved by the Owner. Any excavated material, deemed suitable by the Engineer, may be reused as backfill if authorized by the Engineer.
- G. Provide and operate pumping equipment necessary to maintain all excavations free of subsurface and stormwater as required during construction. Dispose of pumped water as permitted by the Engineer in such a manner that operation and storage areas and other facilities are not flooded.
- H. If the Contractor excavates below the elevations specified, or wherever the excavation is carried beyond the lines and grades specified, the Contractor shall bring the excavation back to the proper elevation by backfilling with fill placed in accordance with "Placement and Compaction" paragraphs of this Section. This work shall be done at the Contractor's expense.
- I. Any increase in cost resulting from backfilling or increasing the size of the footings or foundations due to excess excavation in depth which was not authorized by the Engineer shall be borne by the Contractor.

3.2 SEPARATION OF SURFACE MATERIALS (STOCKPILING)

- A. After clearing and grubbing operations are complete, all existing topsoil (approximately six inches) and deleterious material shall be carefully removed from the disturbed areas and separately stored to be used during site restoration. If the Contractor prefers not to use the separately stored material during site restoration, or if the Contractor prefers not to separate surface materials, the Contractor shall furnish, without additional compensation, clean backfill and Class A topsoil for site restoration.
 - 1. Where site restoration takes place in the wetland areas, topsoil shall be as specified in Section 02240, Ground Preparation for Wetland Planting. Existing topsoil which meets the referenced specifications may be used as such.

SECTION 02200

EARTHWORK

- B. When excavations are to be made in paved surfaces, the pavement shall be cut and removed so as to provide a clean uniform edge with a minimum disturbance of remaining pavement.
- C. If pavement is removed in large pieces, it shall not be mixed with other excavated material, but shall be disposed of away from the site of the work before the remainder of the excavation is made.

3.3 SHEETING AND BRACING

- A. Where necessary, particularly for safety or to prevent disturbance, damage or settlement of adjacent structures, pipelines, utilities, improvements or paving, excavations shall be sheeted and braced. Any damage to new or existing structures occurring through settlement, water or earth pressure, or other causes due to inadequate bracing, through negligence or fault of the Contractor in any other manner, shall be repaired by the Contractor at the Contractor's expense.
- B. Where trenches or excavations exceed 5 feet in depth, the Contractor shall, in advance of the start of the work, submit installation and excavation procedures to the Engineer for review. The information shall include complete details and descriptive data of materials and installation procedures for sheeting and bracing, trench boxes and excavation of side slopes as proposed to be used.
- C. Where sheeting or trench boxes are used, they must be designed by a Professional Engineer licensed to practice in the State of Indiana. The engineer shall provide the Contractor with certification signed and sealed by himself/herself stating that the design of the sheeting and bracing conforms to all applicable requirements of the Indiana Construction Safety Code and the Occupational Health and Safety Act. Copies of this certification shall be submitted to the Engineer.
- D. The Contractor must follow the proposed sheeting plans submitted. No deviations may be made from the filed procedure without first submitting a revised sheeting and bracing plan, signed and certified as required for the original submission, by the same licensed Professional Engineer who prepared the original submission.
- E. All sheeting and bracing not to be left in place shall be carefully removed in such a manner as not to endanger the construction or other structures. All voids left or caused by withdrawal of sheeting shall be immediately backfilled with well-compacted material.
- F. **Sheeting Left in Place**
 - 1. To prevent subsequent damage to structures or property, it may be necessary to leave sheeting, bracing, etc. in place to be embedded in backfill or concrete.
 - 2. Materials used for sheeting and bracing may have to be cut off at any specified elevation due to job conditions.

SECTION 02200
EARTHWORK

3.4 DRAINAGE

- A. At all times during construction, the Contractor shall provide, place and maintain ample means and devices with which to remove promptly and dispose properly of all water entering trenches and other excavations, or water that may flow along or across the site of the work and keep said excavations dry until the structures, pipes, and such appurtenances to be built therein have been completed to such extent that they will not float or be damaged.
- B. Water pumped or drained from the trenches shall be disposed of without undue interference with the work or damage to pavement, other surfaces, or property.
- C. Where required, water pumped from dewatering operations shall be discharged into temporary sedimentation ponds prior to being discharged.
- D. Dewatering operations shall be maintained until such time that there is no danger of floatation of structures.
- E. Subgrades may be subject to deterioration due to wet conditions and construction activities. Contractor shall maintain dewatering operations to prevent disturbance of the subgrade during construction.
- F. Provisions shall be made by the Contractor to safely conduct surface water to suitable water courses and to prevent surface runoff from damaging cut surfaces and fill slopes.

3.5 LOCATION AND PROTECTION OF EXISTING UTILITY LINES

- A. All utility lines shall be located on the ground with pipe locating equipment well ahead of the work at all times. All such locations shall be plainly marked by coded paint symbols on pavement or by marked stakes in the ground. Such locations shall be established at least 50 feet in advance of all excavation. All such location work shall be provided at no extra cost.
- B. As the excavation approaches pipes, conduits, or other underground structures, digging by conventional trenching machine methods shall be done with extreme care. No extra compensation shall be given if manual excavation is done to locate utilities and/or underground structures.
- C. All existing pipes, wires, fences, curbs, property-line markers, and other structures which in the opinion of the engineer must be preserved in place without being temporarily or permanently relocated, shall be carefully supported and protected from damage, and in case of damage, the Contractor shall notify the "property owner" so that proper steps may be taken to repair any and all damage done. When the "property owner" does not wish to make the repairs themselves, all damage shall be repaired by the Contractor or, if not promptly done by the Contractor, the Engineer may have the repairs made at the expense of the Contractor.
- D. All utility services shall be supported by suitable means so that the services do not fail when tamping and settling occur.

SECTION 02200
EARTHWORK

3.6 RELOCATION AND REPLACEMENT OF EXISTING UTILITY LINES

- A. If in the course of construction, the Contractor encounters utility services of any kind not indicated on the Drawings (or otherwise provided for) which encroach upon or are encountered near and substantially parallel to the edge of the excavation and in the opinion of the Engineer will impede progress to such an extent that satisfactory construction cannot proceed, they shall be changed in location, removed (later be restored), or replaced as follows:
 - 1. Whenever the Contractor encounters any of the conditions as described above and is so ordered in writing, he shall do all or part of the work as directed to, change the location, remove and later restore, or replace lines, or to assist the Owner thereof in so doing. For such work, the Contractor shall be issued a Change Order for extra work.
 - 2. In removing existing pipes or as described above, the Contractor shall use care to avoid damage to material, and the Engineer shall include for payment only those new materials which in his judgment are necessary to replace those that are unavoidably damaged.
- B. When fences interfere with the Contractor's operations, the Contractor shall remove and (unless otherwise specified) later restore them to at least as good condition as that in which they were found immediately before the work was begun, all without additional compensation. The restoration of fences shall be done as promptly as possible and not left until the end of the construction period.

3.7 REMOVAL OF EXISTING STRUCTURES

- A. All elements of any existing structures, including piping and backfill, shall be removed from beneath the footprint of each new structure and new pipes and within an area which extends downward and outward from each new structure at a slope of 1 horizontal to 1 vertical.

3.8 EXCAVATION

- A. Excavate to the exact elevations shown on the Drawings or as required by job conditions.
- B. Subsurface rock outcrops may be encountered which may interfere with the proposed basin grade elevations, but such obstructions are expected to be minor. If such outcrops are encountered, the rock should be left in-place and the volumes made up elsewhere.
- C. If the Contractor excavates below the elevations specified, the Contractor shall bring the excavation back to the proper elevation by backfilling with structural fill placed in accordance with the "Placement and Compaction" paragraphs of this Section.
- D. Any increase in cost resulting from backfilling or increasing the size of the footings or foundations due to excess excavation in depth which was not authorized by the Engineer shall be borne by the Contractor.

SECTION 02200
EARTHWORK

3.9 SUBGRADE PREPARATION

- A. Clearing, grubbing, and topsoil stripping (six inches) shall be performed within the proposed construction areas, where indicated on the Drawings, and elsewhere as required. Topsoil shall be stockpiled for later reuse during site restoration operations.
- B. The subgrade materials for the embankments shall be proof-rolled prior to placement of the structural fill during a dry and favorable weather period and under the technical supervision of an Engineer. The proof-rolling shall consist of several passes of a heavy-duty 10-ton sheepsfoot roller. If pumping and weaving is encountered, over-excavation should be conducted and replaced with structural fill, as directed by the Engineer. Should any soft areas be detected by the proof-rolling which cannot be stabilized by additional passes of the equipment, this material shall be undercut and replaced with well compacted structural fill as directed by the Engineer.
- C. Residual soil or decomposed rock subgrade areas which are located beneath or very close to the groundwater level shall be immediately covered with a granular working mat to prevent softening of the natural soil material due to subsequent construction activities or by exposure to the elements. The granular working mat shall have a minimum thickness of 6 inches and shall consist of fill. The material shall be compacted on-grade using manually guided compaction equipment.
- D. Immediately before the Contractor places structural fill on the embankment subgrade, the Engineer shall inspect the subgrade. The Contractor shall correct any deficiencies found during the inspection. The Engineer must approve the subgrade before structural fill is placed.

3.10 BACKFILLING

- A. Complete all backfilling to the dimensions and levels shown on the Drawings.
- B. Excavations shall be backfilled as specified herein.
 - 1. Pipe Bedding
 - a. Take care to avoid contact between the pipe and compaction equipment. The tampers shall be hand or pneumatic of the proper size to operate between trench wall and pipe.
 - b. Do not use compaction equipment directly over the pipe while placing the pipe bedding and/or backfill to insure that such equipment will not damage or disturb the pipe.
 - c. All pipes shall be placed in crushed stone bedding unless otherwise specified. Pipe bedding shall, in all cases, extend up to one half of the pipe diameter.

SECTION 02200

EARTHWORK

- d. The trench shall be excavated to the depth shown on the drawings. The crushed stone shall be placed in the trench for its full width to uniformly support the pipe at the required line and grade.
 - e. Bedding material shall be spread in 4 inch layers and each layer shall be compacted with tampers until the required total depth of bedding has been built up.
2. Backfilling Pipe Trenches
- a. Backfilling shall be performed as shown on the plans. Unless otherwise directed by the Engineer, backfilling shall be started immediately after preliminary alignment inspection is made and shall be continued without interruption to completion.
 - b. Except where special conditions require complete removal of excavated material and backfill with modified materials, backfill shall be made normally with the earth removed from the trench or excavation provided that, in the opinion of the Engineer, the excavated material shall be construed as clay material that will not crumble under light hand pressure, frozen materials, ashes, cinders or other refuse. No material other than earth, or specifically specified material shall be used for backfilling until the pipe or other structure has at least one foot or more of cover. Above that level, except for the last two feet, small stones not larger than 5 inches in their greatest dimension will be permitted in an amount not in excess of 20% of the volume of backfill material, and such stones shall be well distributed throughout the mass.
 - c. At least 30 inches of cover over the top of the pipe shall be provided before the trench is wheel loaded.
 - d. At least 48 inches of cover shall be provided before using mobile trench compactors of the hydro-hammer or impactor type. These compactors shall only be used after the pipe has been properly backfilled in accordance with these Specifications.
 - e. After initial backfilling has been compacted as specified above, the remainder of the trench shall be backfilled with suitable material or general fill. When the material excavated from the trench is deemed unsuitable for backfilling, the Contractor shall supply and install either suitable material from outside sources or select granular material. Backfill material shall be compacted to not less than 90% of the maximum dry density as determined by ASTM D1557.
3. If settlement occurs, additional backfill shall be deposited and mechanically compacted to the required elevation.

SECTION 02200
EARTHWORK

- C. Excavations made in areas where structural fill has been placed shall be backfilled with the same material as removed.
- D. Backfilling shall be done as promptly as is consistent with non-damage to the structures, but no backfilling shall be done before the Engineer gives permission.
- E. Frozen material shall not be placed in the backfill, nor shall backfill be placed upon frozen material. Previously frozen material shall be removed or shall be otherwise treated as required before new backfill is placed.
- F. Below grade structures shall not be backfilled until any supporting floor slabs or other structural systems are in place.
- G. Backfilling around structures shall be accomplished with uniform horizontal lifts of material. The difference in elevation of the backfill on opposite and/or adjacent walls shall not at any time exceed one foot.
- H. All backfill shall be placed in accordance with "Placement and Compaction" paragraphs below.

3.11 PLACEMENT AND COMPACTION

A. General

- 1. No material shall be placed or compacted when it is too wet or frozen or when the subgrade or previously placed material is too wet or frozen. The Engineer shall determine when conditions are suitable for placing and compacting material. All loam and topsoil, sludge and other material judged to be unsuitable by the Engineer shall be removed before any material is placed and compacted.
- 2. The subgrade of all berms shall be properly prepared before any material is placed and compacted. Care shall be taken that stones and lumps shall not become nested and that all voids between stones shall be completely filled with fine material.
- 3. Prior to placement of fill the subgrade shall be proof-rolled except where proof-rolling would be detrimental because of groundwater conditions.

B. Structural Fill

- 1. The undercut material for embankments shall be replaced with structural fill, as defined by the Engineer. Structural fill shall not be placed until preparation of the existing subgrade has been inspected and accepted by the Engineer.
- 2. All grades shall be accomplished by the placement of structural fill in accordance with the following. The structural fill for the berms shall be placed in loose horizontal lifts with a maximum thickness of nine (9) inches.

SECTION 02200

EARTHWORK

3. The fill shall be compacted using compaction equipment as specified by the Engineer. Structural fill shall be compacted to at least 95% of the maximum density. Individual test results as low as 92% of the maximum density are acceptable if the average for the tested lift exceeds 95%. Testing of all materials used to construct the detention basin shall be conducted as specified in "Maintenance of Fill" paragraph below. All fills shall be stable without significant movement under construction traffic as judged by the Engineer. Should the density of the compacted fill be less than specified, the Contractor shall re-compact the area until the specifications are met.

C. Site Filling and Grading

1. Any site grading required, such as pipelines area, shall be accomplished by the placement of general fill. If the Drawings call for the removal of certain undesirable materials, this shall be done prior to placement of general fill.
2. The general fill shall be placed in loose horizontal lifts with a maximum thickness of nine (9) inches.
3. The fill shall be compacted using compaction equipment corresponding to the characteristics of the general fill.
4. Class A or B topsoil shall be placed at a thickness of at least six (6) inches. Topsoil in wetland areas shall be as specified in Section 02240, Ground Preparation for Wetland Planting.

3.12 MAINTENANCE OF FILLS

- A. All vehicles passing over the fill areas shall use diverse routes to insure uniform compaction of the fill.
- B. Before shutdown of the work for any cause and at the conclusion of work for the day, fill shall be shaped to a grade which will insure drainage away from the unfinished surface of the fill.
- C. Excess materials shall be stored as authorized by the Engineer and following completion of the work shall be removed from the site.

3.13 EARTHWORK TESTS AND TESTING

- A. The optimum moisture content and the maximum density of each type of material used for structural fill and general fill shall be determined by "Tests for Moisture-Density Relations of Soils, using 10 lb. Rammer and 18 in. Drop," (ASTM D1557 or AASHTO T-180).
- B. The field moisture content of materials being compacted shall be determined by "Laboratory Determination of Moisture Content of Soil," (ASTM D2216). The field density of compacted material shall be determined by "Test for Density of Soil in Place by the Sand-Cone Method," (ASTM D1556) or "Test for Density of Soil and Aggregate in Place by Nuclear Method (Shallow depth)" (ASTM D-2922).

SECTION 02200
EARTHWORK

- C. The Engineer shall be responsible for determining the materials testing necessary to ensure that the embankments meet the provisions of this Section. The Contractor shall be responsible for arranging all necessary materials testing.
- D. A soils engineering and testing laboratory will be selected by the Contractor and approved by the Engineer prior to any materials testing. The selected soils engineering and testing laboratory shall perform all materials testing and shall be paid by the Contractor. The soils engineering and testing laboratory must promptly, faithfully and accurately report the results of its tests and inspections. Typed results and discussions shall be sent in duplicate to the Engineer with a copy to the Contractor. The Contractor shall submit a report to the Engineer stating whether the reported results comply with the specifications.

3.14 DISPOSAL OF MATERIAL

- A. Excavated material shall be so placed as not to unreasonably interfere with travel. All macadam, surface loam and sod shall be kept separate from the remainder of the excavated material.
- B. Upon completion of the backfilling, the property shall be cleaned, all surplus material removed and the surface restored to the condition in which it was before ground was broken.
- C. Unless otherwise specified, all materials left over shall become the property of the Contractor. Also, underground structures removed, such as brick, concrete and sewer pipe, shall become the property of the Contractor, unless otherwise noted on the Drawings. If the Contractor shall fail to promptly remove surplus material, the Owner may have the material removed and charge the cost thereof as money paid to the Contractor. All surplus excavation shall be removed from the site of the work by the Contractor, but none shall be deposited on private property until written consent of the property owner has been filed with the Engineer. The Contractor's disposal shall comply with all Federal, State and Local laws and regulations.

++ END OF SECTION ++

SECTION 02240
GROUND PREPARATION FOR WETLAND PLANTING

PART 1 - GENERAL INFORMATION

1.1 DESCRIPTION

- A. This work shall consist of the preparation of the wetland areas after clearing and grubbing has been performed. This work shall include stockpiling of topsoil from the site, excavation, soil modification if necessary, reintroduction of the stockpiled topsoil and preparation of the planting bed.

PART 2 - PRODUCTS

2.1 MATERIAL REQUIREMENTS

- A. Materials shall be in accordance with the following:
1. **SUBSTRATE SOIL** shall consist of a clay loam which has a clay content of 27-35 percent and a permeability of 0.20 inches per hour or less. Commercial bentonite may be added to the soil mixture if needed to meet the percent clay or permeability standards.
 2. **TOPSOIL** shall consist of loose friable soil, free of refuse, stumps and large roots, rocks over 2 inches in diameter, brush, weeds, or other material which would be detrimental to the proper development of vegetative growth.

PART 3 - CONSTRUCTION REQUIREMENTS

3.1 OVER EXCAVATION

- A. The wetland planting areas will be over-excavated and lined with six inches of an approved low permeability substrate soil if the native soil does not meet the requirements for substrate soil. The stockpiled topsoil will then be backfilled over the substrate soil.

3.2 FINAL GRADING

- A. The final grade in the bottom of the wetland will be left somewhat irregular to maximize the micro-habitat diversity. Areas to be covered with topsoil shall be tilled to a depth of 2-3 inches. This loosening is to assure bond of the topsoil with the surface on which it is put. The topsoil shall then be spread to a sufficient depth to produce a layer 6-7 inches thick after it has been spread evenly. The final grades after topsoil spreading shall correspond to the plans within a tolerance of ± 0.25 feet. After the topsoil has been placed, the top surface of the soil shall be loosened to a depth of 6 inches. In areas where the above method of preparation is impracticable, a different method may be approved.

++ END OF SECTION ++

SECTION 02270

RIP - RAP

PART 1 - GENERAL

1.1 SCOPE

- A. Provide all labor, material and equipment to furnish and install rip-rap which shall be placed as indicated on the Drawings and herein specified.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 02200, EARTHWORK.

PART 2 - PRODUCTS

2.1 STONE

- A. Stone for this item shall be hard, durable stone, of which 60% of the pieces shall weigh 100 pounds or more. The weight, dry per solid cubic foot shall weigh not less than 105 pounds in air.
- B. Stone or rock excavated from the job site meeting the above requirements may be used in the rip-rap.

2.2 SEMI-PERMEABLE MEMBRANE

- A. The filter fabric shall be a woven or non-woven polypropylene or polyester fabric, durable, permeable and rot-resistant, having a minimum grab tensile strength of 130 pounds.
- B. The fabric shall be Mirafi-400X, Typan No. 3401, Bidim No. C-28 or equal.

PART 3 - EXECUTION

3.1 DESCRIPTION

- A. Prior to placing the rip-rap, the filter fabric shall be installed in accordance with manufacturer's recommendations.
- B. Rip-rap shall be constructed to a minimum depth of 1.5 times the D_{50} size of the rip-rap. Stones shall be carefully interlocked and laid with the flat surface at approximately right angles to the face of the slope or surface. The stones shall be so placed as to make a compact, stable, slope protection with a practicable minimum of surface voids.
- C. Rip-rap shall consist of a surface layer of the flatter larger stones filled in between with smaller stones where necessary to bring to prescribed surface limits. All voids will be filled with the largest practicable stones. Rip-rap may be placed by dumping provided that the

SECTION 02270

RIP - RAP

requirements of these specifications are met. If rip-rap is placed by dumping, it will be necessary to do additional work such as moving individual stones by hand or mechanical equipment to ensure their stability and filling voids, as specified. If rip-rap is dumped a minimum thickness of four (4) inches of AASHTO #57 stone choked with fines shall be spread over the top of the filter fabric. The purpose of the stone is to prevent tearing of the filter fabric.

- D. The surface of the rip-rap may be irregular within an upper tolerance line one-third the prescribed thickness of the rip-rap above, and a lower tolerance line one fourth the prescribed thickness of the rip-rap below the prescribed upper limit of the rip-rap. The Contractor shall select and place a row of the largest available stones along the bottom outside.

++ END OF SECTION ++

STORM PIPES
SECTION 02722

PART 1 - GENERAL INFORMATION

1.1 DESCRIPTION

- A. This work shall consist of the installation of corrugated polyethylene pipe in accordance with these specifications, manufacturer's recommendations, and in conformance with the Drawings (plans), cross sections, typical cross sections and construction standards.

1.2 QUALITY ASSURANCE

- A. The Contractor shall provide the name of the manufacturer's data for corrugated polyethylene pipe.
- B. All corrugated polyethylene pipe shall be manufactured by an experienced and reputable manufacturer whose pipe has been used commercially for at least three (3) years.

PART 2 - PRODUCTS

2.1 CORRUGATED Polyethylene PIPE MATERIALS

- A. The pipe and the coupling bands shall be "N-12" as manufactured by Advanced Drainage Systems, Inc, Columbus , OH, or equal product of other manufacture approved by the Engineer.
- B. Except as otherwise indicated, provide factory fabricated products of the size, joint type, class (thickness), and laying length indicated for each service. Where size, joint type, class or laying length is not indicated, provide products complying with the Indicated standard as determined by the installer for installation requirements.

2.2 PLASTIC PIPE MATERIALS

- A. Plastic Pipe shall be schedule 40 PVC conforming to ASTM D1785, solid wall in sizes as shown on the drawings.
- B. Fittings shall be schedule 40 PVC conforming to ASTM D2464, D2467, and D2665.
- C. Solvent Cement shall be type as recommended by pipe manufacturer and selected by the installer to comply with installation requirements, conforming to ASTM D2564.

PART 3 - CONSTRUCTION REQUIREMENTS

3.1 PIPE TRENCH EXCAVATION

- A. The trench excavation for corrugated polyethylene pipe shall begin at the outlet end and proceed towards the upper end. The trench shall be of sufficient width to provide ample

STORM PIPES
SECTION 02722

working space on both sides of the pipe and to provide space for proper compaction of the backfill around the pipe.

- B. If the trench excavation is made too deep, proper pipe bedding shall be made by backfilling with an approved material to the required elevation. The backfill material shall be compacted into place in order to prevent settling of the pipe or erosion of the backfill.
- C. If stable soils are not found at the required trench bottom grade, the trench shall be excavated at least six (6) inches below the proposed bottom of the CPP elevation, then the trench shall be backfilled, compacted, and shaped to the required elevation. Backfilling shall be with an approved material only. Backfilling with loose, granular sands, pea gravel or other water-bearing materials will not be permitted.
- D. If rock is encountered at the required trench bottom grade, the trench shall be excavated at least six (6) inches below the proposed bottom of the CPP elevation. Then the trench shall be backfilled, compacted, and shaped to the required elevation.

3.2 LAYING PIPE

- A. Corrugated polyethylene pipe shall not be laid on frozen or muddy trench bottom. CPP shall have a firm bearing for its entire length. Placement of the pipe shall begin at the outlet end and proceed upstream. The Contractor shall place the pipe according to the lines, grades and elevations indicated on the plans and construction standards.

3.3 BACKFILLING

- A. Backfill material shall be placed around and over the CPP in six (6) to eight (8) inch lifts. Each lift shall be compacted with caution in order to insure that the pipe is not crushed or displaced.

PART 4 - PAYMENT

4.1 METHOD OF MEASUREMENT

- A. Corrugated polyethylene pipe (CPP) will be measured on a linear foot basis for the size, type, and gauge indicated on the plans or construction standards. Measurement will be made of the pipe in place only. No measurement will be made of the excavation, backfill, joints, fittings and other items necessary for a complete installation unless listed as a separate bid item.

4.2 BASIS OF PAYMENT

- A. There will be no separate payment for corrugated polyethylene pipe. The cost of this work is to be included by the Contractor in the total cost of the contract.
- B. Trench excavation, dewatering of the trench, base stabilization, backfill material, compaction, fittings, joints, bedding material, replacement/repair of farm field tile encountered,

STORM PIPES
SECTION 02722

protection/repair of other utilities, disposal of excess excavated material, and all other construction items and materials necessary to completely install corrugated polyethylene pipe according to the plans, these specification and construction standards will not be paid for separately. The cost of the above items shall be included in the linear foot cost of CPP. No additional or separate payment shall be made for these items unless listed in the Bid proposal by the Engineer as a separate pay item.

+++ END OF SECTION +++

SECTION 02830
WETLAND SEEDING

PART I - GENERAL INFORMATION

1.1 DESCRIPTION

- A. This work shall consist of furnishing, delivering, and seeding wetland areas in accordance with this specification and in conformance with the plans, or as directed by the Engineer.

1.2 GUARANTEE

- A. At least 50% of all individual species planted shall be present as live plants at the end of the first growing season. Aerial coverage of the seeded areas will be at least 70% with no large bare spots. No more than 10% (by aerial cover) of the seeded area will be dominated by perennial weedy species. If these standards are not met, the Contractor will be responsible for supplemental seedings as approved by the Engineer. Losses due to animal depredation, extremes in weather or precipitation, or lack of water control shall not be covered under this warranty.

1.3 QUALITY INSURANCE

- A. The Contractor shall use qualified workmen who are experienced with commercial landscaping work or preferably have previously planted wetland plant seeds.

PART 2 - PRODUCTS

2.1 MATERIALS REQUIREMENTS

- A. Delivery of seed shall be timed to coordinate closely with the planting time. If seed needs to be held for more than one day, it shall be stored in a cool, dry place until such a time as it can be used. In no case shall seed be held over from one year to the next. All seed used shall be scarified and/or cold/moist stratified as recommended for each particular species specified.
- B. Pure live seed shall be delivered in original containers showing analysis of seed mixture, percentage of pure live seed, year of production, net weight, and date of packaging. Damaged packages shall not be accepted.

2.2 ACCEPTABLE PLANTS

- A. The seed species and seeding rates that shall be used shall be as shown on the plans.
- B. Where the plans and specifications call for tree and shrub wetland plantings, a nurse crop shall be planted with the species and rates as shown on the plans.

2.3 SEED SUPPLIERS AND/OR QUALIFIED PLANTING SUBCONTRACTORS

- A. Seeds used should be obtained from local sources if possible or from the following suppliers:

SECTION 02830
WETLAND SEEDING

J. F. New & Associates, Inc.
708 Roosevelt Road
Walkerton, IN 46574
219-586-3400

Spence Nursery
2220 E. Fuson Road
Muncie, IN 47308
317-286-7154

Heartland Restoration Services, Inc.
349 Airport North Office Park
Fort Wayne, IN 46825
(219) 489-8511

or equal.

PART 3 - CONSTRUCTION REQUIREMENTS

3.1 PLANTING INSTRUCTIONS

- A. The ground shall be prepared according to specification Section 02240 before seeding is begun.
- B. In the event that inclement weather or unsuitable soil conditions delay seeding, causing the establishment of undesirable species, a limited program of site specific herbicide application using Round-up herbicide shall be made. The herbicide shall be spot sprayed where necessary to allow the planting schedule to resume in a timely manner.
- C. Seed application may be no-till drilling or drop seeder but shall not be covered with more than 1/4 inch of soil. If the seed is broadcast, an approved mechanical method which shall place the seed in direct contact with the soil may be used. In places inaccessible to mechanical equipment, or where the area to be seeded is small, a hand operated cyclone seeder or other approved equipment may be used.

++ END OF SECTION ++

SECTION 02850
EMERGENT WETLAND PLANTING

PART I - GENERAL INFORMATION

1.1 RELATED WORK SPECIFIED ELSEWHERE

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to this section.

1.2 WORK INCLUDED

- A. This section covers emergent wetland plant specifications, species of plants, method for planting and storage.
- B. This work shall consist of furnishing, delivering, and planting wetland plants in accordance with this specification and in reasonably close conformance with the plans or as directed. Wetland plants, for purposes of this special provision are defined as those plants which for greater than 66 percent of the time are found in areas where the soils are saturated for a significant portion of the growing season.

1.3 GUARANTEE

- A. At least 50% of all individual plants and 75% of all species planted shall be present as live individual plants at the end of the first growing season after planting. If these standards are not met, the Contractor will be responsible for supplemental plantings as approved by the Engineer. Losses due to animal depredation, extremes in weather or precipitation, or lack of water control shall not be covered under this warranty.

1.4 QUALITY INSURANCE

- A. The Contractor shall use qualified workmen who are experienced with commercial landscaping work or preferably have previously planted wetland plants.

PART 2 - PRODUCTS

2.1 ACCEPTABLE PLANTS

- A. The emergent wetland plants that shall be used shall be as specified below or as shown on the plans.

<u>Scientific name</u>	<u>Common name</u>
<i>Leersia oryzoides</i>	Rice Cutgrass
<i>Iris versicolor</i>	Blue Flag Iris
<i>Phalaris arundinacea</i>	Reed Canary Grass
<i>Scirpus validus</i>	Softstem Bulrush
<i>Scirpus pungens</i>	Common Three-Square

- B. Quantities: The number of each species to be planted shall be as shown the plans.

SECTION 02850
EMERGENT WETLAND PLANTING

2.2 PLANT SUPPLIERS AND/OR QUALIFIED PLANTING SUBCONTRACTORS

- A. The emergent wetland plants used should be obtained from local sources if possible or from the following suppliers:

J. F. New & Associates, Inc.
708 Roosevelt Road
Walkerton, IN 46574
219-586-3400

Spence Nursery
2220 E. Fuson Road
Muncie, IN 47308
317-286-7154

Heartland Restoration Services, Inc. or equal.
349 Airport North Office Park
Fort Wayne, IN 46825
(219) 489-8511

- B. Preference shall be given to plants from suppliers within 200 miles of project (if available).

2.3 CONDITION OF PLANTS PRIOR TO PLANTING

- A. All plants shall be delivered free of diseases and molds with the roots kept in a moist condition. Roots must not be allowed to dry out during planting. Transplants and cuttings shall be stored in a cool location and rooted plants shall be watered as needed to reduce stress before planting.

PART 3 - CONSTRUCTION REQUIREMENTS

3.1 PLANTING INSTRUCTIONS

- A. Plants will be planted in groups approximately two and one half (2.5) feet on center in a random pattern, not in rows, across the planting zone as shown in the plans. The method for planting wetland plants into the ground will consist of inserting and rotating a trowel or dibble into the soil and inserting the plant roots into the hole created so that they are completely buried. The stakes shall be removed as directed by the Engineer.
- B. Under no circumstances should planting be done when the air temperature is below freezing. Planting should be accomplished when the air temperature is 32 degrees F and rising or 40 degrees F. Planting should be completed by August 1 to achieve the best performance.
- C. Fertilizer for nursery stock shall be nine-gram AgriForm slow-release fertilizer tablets (22%N - 8%P - 2%K) at an application rate of one tablet per plant installed. All seeded areas shall receive 10%N - 10%P - 10%K fertilizer at a rate of 600 lbs/acre.

++ END OF SECTION ++

SECTION 02870
AQUATIC PLANTING

PART 1 - GENERAL INFORMATION

1.1 DESCRIPTION

- A. This work shall consist of furnishing, delivering, and planting aquatic plants in accordance with this specification and in conformance with the plans or as directed by the Engineer. Aquatic plants, for purposes of this specification are defined as those plants which under normal conditions grow in water of greater than 1 foot in depth.

1.2 GUARANTEE

- A. At least 50% of all individual species and 75% of all species planted shall be present as live individual plants at the end of the first growing season after planting. If these standards are not met, the Contractor will be responsible for supplemental seedlings as approved by the Engineer. Losses due to animal depredation, extremes in weather or precipitation, or lack of water control shall not be covered under this warranty.

1.3 QUALITY INSURANCE

- A. The Contractor shall use qualified workmen who are experienced with commercial landscaping work or preferably have previously planted aquatic plants.

PART 2 - PRODUCTS

2.1 MATERIALS REQUIREMENTS

- A. The aquatic plants that shall be used shall be as specified below or as shown on the plans.

<u>Scientific name</u>	<u>Common name</u>
<i>Sagittaria latifolia</i>	Duck Potato
<i>Pontedaria cordata</i>	Pickerelweed
<i>Peltandaria virginica</i>	Arrow Arum
<i>Scirpus validus</i>	Softstem Bulrush
<i>Zizania aquatica</i>	Wild Rice

- B. Quantities: The number of each species to be planted shall be as shown the plans.
- C. 6 x 1 x 6 Galvanized Sod Staples or wire equivalent shall be used for securing aquatic plant roots in the soil.

SECTION 02870
AQUATIC PLANTING

2.2 PLANT SUPPLIERS AND/OR QUALIFIED PLANTING SUBCONTRACTORS

- A. Plants used should be obtained from local sources if possible or from the following suppliers:

J. F. New & Associates, Inc.
708 Roosevelt Road
Walkerton, IN 46574
219-586-3400

Spence Nursery
2220 E. Fuson Road
Muncie, IN 47308
317-286-7154

Heartland Restoration Services, Inc. or Equal.
349 Airport North Office Park
Fort Wayne, IN 46825
(219) 489-8511

PART 3 - CONSTRUCTION REQUIREMENTS

3.1 PLANT STORAGE AND TRANSPORTING

- A. Aquatic plants shall be stored properly to reduce stress before planting. Plants with leaves shall be stored in buckets or tubs of water in a cool location until ready to transport. For transportation to the site, plants may be packed in plastic bags surrounded with wet newspaper or other approved substance to maintain high humidity. Plants shall be protected from the wind during transportation. If outside temperatures are greater than 70 - 75 F they shall be transported in an insulated container in which the temperature is between 50 F and 65 F. Tubers shall be stored in plastic bags with high humidity and kept in a cool location until planted.

3.2 PLANTING INSTRUCTIONS

- A. Plants will be planted approximately in a random pattern across the planting zone as indicated on the plans. The method for planting aquatic plants into standing water will consist of inserting and rotating a trowel or dibble into the soil and inserting the plant roots into the hole created so that they are completely buried. The plant will be held to the bottom by insertion of a sod staple, or equal, around the tuber. Care shall be taken not to damage the plant when inserting the staple. Other methods of securing plants to the bottom may be considered for approval as an alternative to stapling. On sites located near open water, goose grazing deterrents may be used.
- B. Under no circumstances should planting be done when the air temperature is below freezing. Planting should be accomplished when the air temperature is 32 degrees F and rising or 40 degrees F. Planting should be completed by August 1 to achieve the best performance.
- C. Fertilizer for nursery stock shall be nine-gram AgriForm slow-release fertilizer tablets (22%N - 8%P - 2%K) at an application rate of one tablet per plant installed. All seeded areas shall receive 10%N - 10%P - 10%K fertilizer at a rate of 600 lbs/acre.

++ END OF SECTION ++

DIVISION 3

CONCRETE

SECTION 03100
CONCRETE FORMWORK

PART 1 - GENERAL

1.1 SCOPE

A. Description of Work

1. Provide all labor, material and equipment to furnish and install all concrete formwork as shown on the Drawings and as specified herein.
2. The work also includes the removal of forms at completion of the concrete work.

B. Related Work Specified Elsewhere

1. Section 02110, EROSION AND SEDIMENT CONTROL PLAN
2. Section 02200, EARTHWORK
3. Section 03200, CONCRETE REINFORCEMENT
4. Section 03300, CAST-IN-PLACE CONCRETE

1.2 QUALIFICATIONS

A. Codes and Standards

1. All concrete formwork shall conform with the applicable requirements of the following standards except as specified otherwise herein.
 - a. The American Concrete Institute's "Recommended Practice for Concrete Formwork," ACI 347.
 - b. The International Conference of Building Officials' "Uniform Building Code," Volume I, Section 2607.
2. The above standards are hereby made a direct part of this specification.

PART 2 - MATERIALS

2.1 FORM MATERIALS

A. Boards

1. Boards shall be 6" or 8" ship-lapped or tongue and groove "Standard" grade Douglas fir, conforming to the "Standard Grading and Dressing Rules No. 15," of the West Coast Lumber Inspection Bureau. Boards shall be S4S.

SECTION 03100
CONCRETE FORMWORK

- B. Plywood shall conform to U.S. Product Standard PS 1-66 and shall be a minimum of 5/8" thick. Each panel shall carry the grade trademark of the American Plywood Association along with the DFPA Quality stamp.
 - 1. Plywood for standard finishes, and surfaces to receive membrane waterproofing shall be "B-B Plyform Class 1 Exterior" grade.
- C. Framing, Studding and Bracing
 - 1. Framing, studding and bracing shall be "Standard" or "Construction" grade Douglas fir, rough or S4S, conforming the herein before specified Grading and Dressing Rules No. 15.

2.2 FORMWORK ACCESSORIES

- A. Form ties and Spreaders
 - 1. Standard metal form clamp assembly, of type acting as spreaders and leaving no metal within 1.5" of concrete face. Inner tie rod shall be left in concrete when forms are removed. Submit samples and manufacturer's specifications to the Engineer for approval before using. No wire ties or wood spreaders will be permitted. All ties and spreaders shall be provided with waterstop plates.
- B. All metal ties and anchors which remain embedded in the concrete shall be galvanized or stainless steel.

2.3 FORM COATING

- A. Form coating shall be a non-grain raising and non-staining type that will not leave residual matter on surface of concrete or adversely affect proper bonding of subsequent application of other material applied to concrete surface, "Nox-Crete Form Coating" as manufactured by the Nox-Crete Co., "Arcal-80" as manufactured by Arcal Chemical Corp., "Synthes" as manufactured by Industrial Sythetics Co., are approved types. Coatings containing mineral oils or other non-drying ingredients will not be permitted.

PART 3 - EXECUTION

3.1 FORMWORK GENERAL

- A. Boards may be used for concrete which will not be exposed in the finished work, and which are not otherwise scheduled or specified.
- B. Contractor, at his option, may use plywood for forms in lieu of boards.
- C. Steel forms may be used in lieu of plywood forms.

SECTION 03100
CONCRETE FORMWORK

3.2 EARTH FORMS

- A. Forms Below Grade: Earth cuts shall not be used as forms.

3.3 WOOD AND STEEL FORMS

- A. *General* Wood and/or steel forms shall be constructed of sound material, shall be of the correct shape and dimensions, mortar tight, of sufficient strength, and so braced and tied together that the movement of men, equipment, materials, or placing and vibrating the concrete will not throw them out of line or position. For circular structures, circular forms shall be used. The use of chords will not be permitted. Forms shall be strong enough to maintain their exact shape under all imposed loads. Camber where necessary to assure level finished soffits. Forms shall be so constructed that they may be easily removed without damage to the concrete. Before concrete is placed in any form, the horizontal and vertical position of the form shall be carefully verified and all inaccuracies corrected. All wedging and bracing shall be completed in advance of placing of concrete.
- B. *Forms for Exposed Concrete* Forming panels shall be clean, smooth, uniform in size, and free from damaged edges and holes. Full size (4 feet by 8 feet) panels shall be used wherever possible. After construction, tape joints of plywood panels to prevent joint protrusions in concrete. Horizontal joints must be level and continuous. All edges of plywood must be backed to prevent separation. Use special care in the forming and stripping of the forms to protect the corners. Form inside corners with mitered boards so that no concrete is placed against form ends.
- C. *Framing and Bracing* Space studs at 16" on center maximum for boards and 12" on center maximum for plywood. Framing, bracing, supporting members, and centering shall be of ample size and strength to safely carry, without deflection, all dead and live loads to which forms may be subjected, and shall be spaced sufficiently close to prevent any bulging or sagging of forms. Soffits of all beam forms shall be constructed of 2" minimum thick material. Concrete out of line, level, or plumb will be cause for refection of the whole work affected. Distribute bracing loads over base area on which bracing is erected. When placed on ground, protect against undermining or settlement.
- D. *Tolerances* Deflection of beams, soffits of openings, and structural slabs shall not exceed 1/8" for their entire length, unless cambered to compensate for such deflection.
- E. *Chamfered Corners* For all exposed corners, provide moldings in forms for all chamfering required. Moldings shall be 45 degree right triangle in profile of size required, milled from wood free from open defects. All interior and exterior corners shall be chamfered 3/4" unless noted otherwise.
- F. *Form Ties* Form ties shall be of sufficient strength and used in sufficient quantities to prevent spreading of the forms. Ties shall be placed at least 1.5" away from the finished surface of the concrete. The use of ties consisting of twisted wire loops will not be permitted. Inner rods shall be left in concrete when forms are stripped. All form ties shall be spaced equidistant, and symmetrical, and shall line up both vertically and horizontally.

SECTION 03100
CONCRETE FORMWORK

- G. *Clean-outs and Access Panels* Provide removable clean-out sections or access panels at the bottom of all forms to permit inspection and effective cleaning of loose dirt, debris, and waste material. All forms and surfaces to receive concrete shall be cleaned of all chips, sawdust, and other debris and shall be thoroughly blown out with compressed air just before concrete is placed.
- H. *Arrangement* Arrange formwork to allow proper erection sequence and to permit form removal without damage to concrete.
- I. *Construction Joints* Construction joints shall be formed as specified in Section entitled "Cast-In-Place Concrete". Provide a surfaced pouring strip where construction joints intersect exposed surfaces to provide straight line at joints. Just prior to subsequent pour, remove strip and tighten forms to conceal shrinkage. Construction joints shall show no "over-lapping" of concrete and shall, as closely as possible, present the same appearance as butted plywood joints. Joints in a continuous line shall be straight, true and sharp.
- J. *Embedded Items* All embedded items shall be securely anchored in correct location and alignment prior to placing concrete.
- K. *Openings for items Passing Through Concrete* Frame openings in concrete where indicated on drawings. Contractor shall establish exact locations, sizes, and other conditions required for openings and attachment of work specified under other sections. Contractor shall be held responsible for proper coordination of all work of this nature in order that there will be no unnecessary cutting and patching of concrete. Any cutting and repairing to concrete required as a result of failure to provide for such openings shall be paid for by the Contractor at no additional expense to the owner and the Engineer.
- L. *Shores and False Work* Contractor shall be fully responsible for the proper strength, safety, and adequacy of all falsework, supports, posts, footings, etc., used on and in connection with the work. Falsework and supports shall be adequate in size and strength to resist the loads imposed upon them without deformation, deflection, or settlement.
- M. *Re-use and Coating of Forms* Thoroughly clean forms and re-coat with specified form coating before each re-use. Do not re-use any form for exposed work which can not be reconditioned to "like new" condition. Discard unsatisfactory forms. Apply form coating to all forms in accordance with the manufacturer's specifications. Apply form coatings before placing reinforcing steel.
- N. *Inspection* Prior to placing of any concrete, and after placement of reinforcing steel in the forms, Contractor shall notify the Engineer so that proper inspection may be made.
- O. *Rejection of Defective Work Due to Improper Forms* Any movement or bellying of forms during construction or variations in excess of the tolerances specified will be considered just cause for the removal of such forms and, in addition, the concrete work so affected. Reconstruction of forms and new concrete shall be furnished at no additional cost to the Owner.

SECTION 03100
CONCRETE FORMWORK

3.4 REMOVAL OF FORMS AND SHORES

- A. The supporting forms and shoring shall not be removed until the members have acquired sufficient strength to support their weight and the loads super-imposed thereon safely. In no case may any forms or shoring be removed until the time and sequence has been approved by the Engineer. Earlier removal than specified below may be approved by the Engineer, based on the weather and tests of job-cured cylinders. All formwork shall be removed without damage to the concrete.
- B. The minimum time for forms and shoring to remain in place shall be as follows:
 - 1. Outlet risers: 24 hours
 - 2. Any request for earlier removal of forms and shoring shall be made to the Engineer in writing, along with supporting evidence that the safety of the structure will not be impaired. Contractor shall prepare test cylinders in accordance with ASTM C31 and have compression tests performed in accordance with ASTM C39, at his own expense, as supporting evidence for earlier form removal.
- C. During the period that forms are in place on the concrete work, said forms shall be kept wet at all times.
- D. In removing plywood forms, no metal pinch bars shall be used and special care shall be taken in stripping. Start at the top edge or vertical corner where it is possible to insert wooden wedges. Wedging shall be done gradually and shall be accompanied by light tapping on the plywood panels to crack them loose. Do not remove forms with a single jerk after it has been started at one end.
- E. Forms shall be left in place as long as possible to permit shrinkage away from concrete, and plywood forms shall be left in place until there is no danger of damaging the concrete due to other work in the vicinity.
- F. Nothing herein shall be construed as relieving the Contractor of any responsibility for the safety of the structure.
- G. After stripping, Contractor shall properly protect all concrete to be exposed in the finish work from damage, with boards and non-staining building paper to prevent staining, spalled edges, chips, etc.
- H. Shoring shall be adequate in strength and shall be so designed and placed that the load from successive parts of the structure will be transmitted directly through the falsework without creating bending or shearing stresses in the concrete. Do not remove shores until supporting members have attained sufficient strength to carry the imposed loads.

++END OF SECTION++

SECTION 03200
CONCRETE REINFORCEMENT

PART 1 - GENERAL

1.1 SCOPE

A. Description of Work

1. Furnish and install all concrete reinforcement necessary for the concrete work as shown on the Drawings and as specified herein.

B. Related Work Specified Elsewhere

1. Section 03100, CONCRETE FORMWORK
2. Section 03300, CAST-IN-PLACE CONCRETE

1.2 QUALIFICATIONS

A. Applicable Specifications

1. "Specifications for Deformed Billet-Steel Bars for Concrete Reinforcement", (ASTM A615).
2. "The Manual of Standard Practice for Reinforced Concrete Construction", by Concrete Reinforcing Steel Institute.
3. "The Manual of Standard Practice for Detailing Concrete Structures", (ACI Standard 315).
4. "Placing Reinforcing Bars" by Concrete Reinforcing Steel Institute.
5. "Building Code Requirements for Reinforced Concrete", (ACI Standard 318).
6. "Splicing Reinforcing Bars" by the Concrete Reinforcing Steel Institute.
7. "Tension Testing of Metallic Materials", (ASTM E8).

1.3 SUBMITTALS

A. Shop Drawings

1. All reinforcement shall be installed in accordance with the Contract Plans. Shop drawings, including sizes, quantities, fabrication and installation are deemed the responsibility of the Contractor, and shall not be submitted to the Engineer.

SECTION 03200
CONCRETE REINFORCEMENT

2. Details of concrete reinforcement not covered in these specifications shall be in accordance with the "Manual of Standard Practice for Reinforced Concrete Construction" as published by the Concrete Reinforcing Steel Institute.
- B. Mill Reports
1. Three (3) certified copies of mill tests on each heat of reinforcing steel delivered showing physical and chemical analysis shall be furnished to the Engineer by the Contractor. The ladle analysis shall be obtained from the manufacturer and the Contractor shall certify that the steel furnished conforms to the ladle analysis. The ladle analysis shall state the percentages of carbon, phosphorus, manganese and sulfur present in the steel. The Engineer, at his option may perform check analysis on the reinforcing steel and all steel not conforming to the aforementioned ladle analysis and physical properties may be rejected and shall be replaced at no cost to the Owner.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. All reinforcing bars shall conform to ASTM A615, Grade 60.
- B. Reinforcement shall be accurately placed and secured against displacement by firmly wiring at intersections and splices with not less than 16 gauge black annealed wire.
- C. Reinforcing bar supports shall conform to the "Bar Support Specifications and Standard Nomenclature" as contained in "The Manual of Standard Practice for Reinforced Concrete Construction" as published by the Concrete Reinforcing Steel Institute. Wherever the legs of any support devices rest directly upon forms which, after stripping, will expose the concrete surfaces to permanent view, then these devices shall either be zinc galvanized or provided with plastic button tips at the ends to prevent rust staining of the concrete.

2.2 FABRICATION

- A. All reinforcement shall be of clean new stock, free from defects, mill or rust scales, or coatings that will reduce bond. Reinforcement shall be cold bent to the required shapes. The heating of reinforcement for bending will not be permitted. Reinforcing bars shall not be bent or straightened in a manner that will injure the material.
- B. All hooks shall be bent using the pin diameters and dimensions as defined as "ACI Standard Hooks" in "The Manual of Standard Practice for Reinforced Concrete Construction" as published by the Concrete Reinforcing Steel Institute unless otherwise shown on the Plans.
- C. Reinforcing bars shall conform accurately to and within the fabricating tolerances as shown in the "Manual of Standard Practice for Reinforced Concrete Construction" as published by the Concrete Reinforcing Steel Institute.

SECTION 03200
CONCRETE REINFORCEMENT

PART 3 - EXECUTION

3.1 PLACING

- A. The placement of bars should conform to "Placing Reinforcing Bars" as published by the Concrete Reinforcing Steel Institute.
- B. Bars should be securely tied to prevent displacement during the pouring operation and all dowels must be wired in place before depositing concrete.
- C. All splicing of bars, concrete cover, and bar spacings shall conform to "Building Code Requirements for Reinforced Concrete (ACI 318)" as published by the American Concrete Institute and to recommended practices in "Splicing Reinforcing Bars" by the Concrete Reinforcing Steel Institute unless shown otherwise on the Plans.

3.2 SPLICING

- A. Splices in Reinforcement:
 - 1. Lapped ends of bars shall be placed in contact and securely wired.

++END OF SECTION++

SECTION 03300
CAST-IN-PLACE CONCRETE

PART I - GENERAL

1.1 SCOPE

A. Description of Work

1. Furnish all labor, materials and equipment necessary to completely furnish and install the Cast-In-Place Concrete as shown on the Drawings and as specified herein.

B. Related Work Specified Elsewhere

1. Section 03100, CONCRETE FORMWORK
2. Section 03200, CONCRETE REINFORCEMENT

1.2 APPLICABLE SPECIFICATIONS

A. The Contractor shall follow the practices and standards of the following American Concrete Institute Specifications which are made part of this specification:

1. ACI-211 - Recommended Practice for Selecting Proportions for Concrete
2. ACI-214 - Recommended Practice for Evaluation of Compression Test Results of Field Concrete
3. ACI-304 - Recommended Practice for Measuring, Mixing, and Placing Concrete
4. ACI-305 - Recommended Practice for Hot Weather Concreting
5. ACI-306 - Recommended Practice for Cold Weather Concreting
6. ACI-318 - Building Code Requirements for Reinforced Concrete

B. ASTM C150 "Specification for Portland Cement"

C. ASTM C33 "Specification for Concrete Aggregates"

D. ASTM C260 "Specification for Air-Entraining Admixture for Concrete"

E. ASTM C494 "Specification for Chemical Admixtures for Concrete"

F. ASTM C509 "Specification and Tests for Cellular Elastomeric Preformed Gasket and Sealing Material"

1.3 SUBMITTALS

A. All submittals shall be in accordance with Section 01300, SUBMITTALS.

B. Submittals shall include, but not be limited to, the following:

1. Type and brand of cement used

SECTION 03300
CAST-IN-PLACE CONCRETE

2. Design mix
3. Delivery tickets

1.4 CLASS OF CONCRETE

- A. All concrete work on this Contract shall be 4500 psi concrete.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Cement

1. Cement for all concrete shall be an approved brand of Portland Cement, ASTM C150, Type I. In the event field conditions require, and the Engineer finds it acceptable, a high-early strength Portland Cement, Type III may be used. Only one brand of cement shall be used in this work.

- B. Water shall be clean, free from organic or vegetable matter, acid, alkali, or other injurious elements. It shall be virtually free from chloride ions.

C. Aggregate

1. All aggregate shall be for normal weight concrete and shall conform to the "Specifications for Concrete Aggregates" ASTM C-33.
2. Fine and coarse aggregate shall be regarded as separate ingredients. Each size of coarse aggregate, the combination of the different sizes of coarse aggregate shall conform to the grading requirements of the ASTM Specifications C33. All fine aggregates shall be natural and not manufactured.
3. The coarse aggregates for all concrete work shall be size no. 57 or no. 67 as described in ASTM C-33 and shall conform to the quality requirements noted therein except that the following limitations shall apply:

Soft Particles	2.0 Percent maximum
Chart as a soft impurity	1.0 percent maximum
Total of soft particles and chart as a soft impurity	2.0 percent maximum
Flat and elongated particles (long dimension more than 5 times short dimensions)	15.0 percent maximum

SECTION 03300
CAST-IN-PLACE CONCRETE

- D. Air-entraining agents shall conform to ASTM C260, by latest edition. Approved types are Darex AEA by W.R.Grace, MB - VR by Master Builders, or Air Mix by the Euclid Chemical Co.
- E. Water reducing admixture shall conform to Classes 3 and/or 4 of ACI 212 and meet the performance criteria of ASTM C494, Type A or D. The use of lignosulfonic acids and their salts is not allowed. In addition, the admixture shall not contain more than 1 percent chloride ion and shall add no more than 25 ppm chloride ion to a resultant cubic yard of concrete. Approved admixtures are as follows:

<u>TYPE A</u>	<u>TYPE D</u>	<u>MANUFACTURER</u>
Plastocrete	Plastiment	Sika Chemical Co.
Pozzololith 200-N	Pozzololith 100-XR	Masters Builders
WRDA with HYCOL	Daratard-17	W.R. Grace & Co.
Eucon WR-75	Eucon retarder 75	Euclid Chemical Co.

- F. All reinforcing bars shall conform to ASTM A615 Grade 60.
- G. Waterstops
1. Type I for general usage shall be made of neoprene rubber, 6" x 3/8" dumbbell shape, conforming to U.S. Corps of Engineers Specification CRD-C513-71. Approved manufacturers are Serviced Products Div. of W.R. Grace & Co., Philadelphia, PA; Williams Products, Troy, MI; and Kirkhill Rubber, Brea, CA.
- H. Sealants for concrete structures shall be as follows:
1. For general usage a two-part pressure grade polysulfide systems. Approved types are Colma Joint Sealer by Sika Chemicals Corp., Versiteal by W.R. Grace, and Chem-Calk 400 by Woodmont Products, Inc.
 2. Backup material shall be PVC or neoprene rod with a shore A hardness of 50.

2.2 PROPORTIONING

- A. Concrete mix shall have a consistency enabling it to be readily worked into all corners of the form and around all reinforcing by usual methods of placing and consolidating without permitting segregation or excessive free water.
- B. All concrete on the project shall be air-entrained, and the air content shall be six (6) percent, plus or minus one (1) percent.
- C. All concrete on the project shall contain water reducing admixture specified in Paragraph 2.1E. It shall be used in strict accordance with the manufacturer's recommendations.
1. Contractor shall submit a certificate from an approved laboratory attesting to the admixture meeting and exceeding the physical requirements of this Specification.

SECTION 03300
CAST-IN-PLACE CONCRETE

- D. The admixture manufacturer shall provide, at no cost, the services of a qualified concrete technician to assure proper use of all admixtures. Manufacturer shall certify in writing that the admixture was used in accordance with his instructions.
- E. No admixture other than those specified above will be permitted without written approval of the Engineer.
- F. A testing laboratory, approved by the Engineer, and paid by the Contractor, shall establish the mix proportions. The mix proportion shall be selected on the basis of the Laboratory Trial Batches.
 - 1. The Class A mix design shall have minimum 28 day cylinder strength of 4,500 lbs. and a maximum w/c ratio is 5 gallons per sack of cement.
 - 2. Selection of Concrete proportions by Laboratory Trial Batches:
 - a. Laboratory Trial Batches shall be used as a basis for selecting concrete proportions. A water cement ratio-compressive strength curve shall be established with at least three (3) points representing batches which produce strengths above and below that required. Each point on the curve shall represent the average of at least three specimens tested at twenty-eight (28) days. The slump and air content of the batches shall be the maximum permitted by this specification.
 - b. A point on the water cement ratio-strength curve shall be selected that will provide an average strength of at least 1200 psi greater than the required specified strength in Paragraph 1 above.
- G. The slump of the concrete mix shall be four (4) inches.
- H. Concrete design mix shall be submitted to the Engineer for approval before work commences. No concrete shall be placed until the Engineer has approved the design mix.

PART 3 - EXECUTION

3.1 DELIVERY OF CONCRETE

- A. A delivery ticket shall be submitted with each batch at the time of delivery. This ticket shall show the following:
 - 1. Amount of aggregate water
 - 2. Amount of batch water
 - 3. Quantities of sand, stone and cement
 - 4. Design strength

SECTION 03300
CAST-IN-PLACE CONCRETE

5. Time truck leaves batch plant
- B. Failure to render such ticket to the Contractor's Job Superintendent shall automatically be cause for rejection of the concrete. The Contractor's Job Superintendent shall write the following on the back of the delivery ticket:
 1. Time of arrival of truck mixer on site
 2. Time of deposit of concrete from truck
 3. Place of deposit of the concrete
- C. Failure to deliver such completed ticket to the Engineer will be cause for the Engineer to reject the deposited concrete at any time and cause it to be removed and replaced at the Contractor's expense. No concrete shall be deposited on the job when it has contained its mix water longer than 60 minutes.

3.2 PLACING CONCRETE

- A. Before placing concrete, all construction debris, water and ice shall be removed from the places to be occupied by the concrete. Particular attention shall be given to the removal of dirt and debris from all formed construction joints.
- B. Rock surfaces upon which concrete is to be placed shall be level, free from oil, water, mud, loose semidetached or unsound rock fragments and rough enough to assure bond with concrete. Immediately before placing concrete, clean rock surfaces by high velocity air water jets or by sand blasting.
- C. Concrete shall be deposited in approximately horizontal layers not to exceed 18 inches in thickness to avoid flowing along the forms. Concrete during and immediately after depositing shall be thoroughly compacted by means of suitable tools. The concrete shall be thoroughly worked around the reinforcement and around embedded fixtures, and into the corners of the forms. When mechanical vibration is used, the number and type of vibrators shall be subject to the approval of the Engineer. In general, the use of vibrators shall be in accordance with the Portland Cement Associations' "Specifications for Vibrating Concrete, ST. 26".
- D. Falling concrete shall be closely confined in a drop chute of the proper size to within two or three feet of the place of deposit in the forms and the final drop must be vertical to avoid segregation of aggregates. In no case shall concrete be deposited from a height that will cause separation of the aggregates.
- E. In placing concrete, care shall be taken to avoid disturbing the steel reinforcing extending into concrete which had partially set.
- F. Concrete shall be mixed in such quantities as required for immediate use and shall be placed while fresh before loss of slump occurs. Re-tempering by adding water to restore slump lost during excessive mixing or due to too long a lapse of time since initial mixing will not be permitted.

SECTION 03300
CAST-IN-PLACE CONCRETE

3.3 TEMPERATURE OF CONCRETE

- A. Concrete, when deposited, shall have a temperature ranging between a minimum of fifty (50) degrees Fahrenheit and a maximum of ninety (90) degrees Fahrenheit.
- B. When the temperature of the surrounding air is below forty (40) degrees Fahrenheit or above ninety (90) degrees Fahrenheit, concreting shall be done in accordance with the recommendations noted in ACI-306 and ACI-305 respectively.

3.4 PROTECTION OF NEW WORK

- A. All freshly placed concrete shall be adequately protected from mechanical injury or by action of the elements until such time as the concrete is thoroughly set.
- B. Projecting inserts, anchor bolts, etc. shall be protected from disturbances until the concrete has sufficiently set to hold such items immovable.

3.5 FINISHING

- A. Face forms shall be removed as soon as concrete has set sufficiently to retain shape. Vertical surfaces exposed in the finish work shall be plastered with cement grout where necessary and troweled smooth.

3.6 CURING

- A. Curing shall be started as soon as it is possible to apply the curing medium without damaging the surface, preferably immediately upon completion of the finishing operation. Curing shall continue uninterrupted for a minimum period of 14 days unless a longer period is hereinafter specified. Rapid drying upon completion of the curing period shall be prevented. At no time during the curing period shall the temperature of the concrete be permitted to drop below 40 degrees Fahrenheit.
- B. Concrete surfaces shall in general be cured by one of the following methods:
 - 1. Ponding or continuous sprinkling
 - 2. Two thicknesses of an approved woven fabric or quilted fiber mat kept continuously wet.
 - 3. Three inches of moist cured hay, grass, or clean straw uniformly distributed and kept continuously wet.
 - 4. Polyethylene sheeting shall be natural color and shall have a nominal thickness of 0.006 inch. The loss of moisture when determined in accordance with ASTM C156 shall not exceed 0.055 grams per square centimeter of surface.

SECTION 03300
CAST-IN-PLACE CONCRETE

5. Polyethylene-coated burlap shall be 4 mil white opaque polyethylene film impregnated or extruded into one side of the burlap. Burlap shall weigh not less than 9 ounces per square yard. The loss of moisture when determined in accordance with ASTM C156 shall not exceed 0.555 gram per square centimeter of surface.
6. Curing compounds shall conform to Federal Spec. TT-C-800A with a minimum solids content of 30 percent. Approved compounds are those manufactured by the Euclid Chemical Co.
7. Steel forms and all wood forms in contact with the concrete during the final curing period shall be kept continuously wet. If forms are to be removed during the curing period, one of the above curing materials or methods shall be employed immediately. Such curing shall be continued for the remainder of the curing period.

3.7 JOINTS

- A. Construction joints shall be located as required by code standards and as called for on the drawings. All reinforcing steel shall be continued across construction joints unless shown otherwise on the drawings.
- B. In general, formed construction joints or keys shall be in width one-third (1/3) of the width of the concrete and in depth one-sixth (1/6) of the depth of the concrete. All keys shall be continuous and none smaller than two (2) inches in width and two (2) inches in depth shall be used.
- C. Before concreting is resumed, the surfaces of previously placed concrete shall be cleaned and coated with an approved epoxy bonding compound as manufactured by the Euclid Chemical Co. or Sika Chemical Co. New concrete shall be placed after the bonding compound becomes tacky.

3.8 WATERSTOPS

- A. Provide all clips, wire and/or appurtenances as required to secure waterstop to forms and reinforcing steel. Waterstops must be secured such that they will in no way be displaced during concrete placement. Contractor shall submit to the Engineer a drawing showing his proposed method of supporting the waterstop in the forms.
- B. Waterstops shall be installed in a continuous uninterrupted line to form a watertight diaphragm throughout all joints in a particular structure.
- C. For Type I Waterstops:
 1. Waterstops shall be furnished complete with all necessary fittings, unions, ells, tees, crosses,, etc., and approved rubber cement.
 2. Splices shall have a solid web through the center of the union to insure centering of the waterstop in the splice.

SECTION 03300
CAST-IN-PLACE CONCRETE

3.9 PIPES, DRAINS, AND MISCELLANEOUS EMBEDDED ITEMS

- A. Provide and embed into the concrete all necessary pipes, anchors, bolts, sleeves, inserts, wall ties, etc., as required for the installation and attachment of other work. Such miscellaneous items shall be set accurately to template built into the concrete plumb and maintained so during the placement of concrete by securely wiring as may be necessary.
- B. Provide such openings as shown on the drawings and as are required for the passing of work through the concrete and reinforce around openings.
- C. Great care shall be taken to keep items embedded in the concrete, and openings provided through the concrete at the proper locations. The concrete shall be thoroughly spaded and worked around and under such items so that there will be no voids.
- D. Bolts shall project from the face of the concrete the distance called for on the drawings, or a sufficient distance to allow for the proper attachment. All threads shall be oiled and protected by waterproof caps.

PART 4 - SAMPLING, TESTING AND ENFORCEMENT

4.1 TESTING LABORATORY

- A. An approved laboratory selected by the Engineer, but paid by the contractor, shall establish the mix proportions and test the concrete. One test shall be performed for each 100 cubic yards of concrete or for each 5000 square feet of surface area placed. The laboratory shall maintain records showing the following:
 - 1. brand of cement
 - 2. brand and quantity of admixtures
 - 3. time and location of the test batch
 - 4. air content
 - 5. slump
 - 6. compressive strength

The laboratory shall supply the test cylinders, slump cones, field technicians, and all equipment necessary for performance of field and laboratory testing specified herein.

- B. One strength test shall consist of four field specimens, two (2) specimens for testing at seven (7) days, and two (2) specimens for testing at twenty-eight (28) days. The samples for strength tests shall be taken in accordance with "Method of Sampling Fresh Concrete" (ASTM C-172). Cylinders for acceptance tests shall be laboratory cured in accordance with "Methods of Making and Curing Concrete Compression and Flexure Test Specimens in the Field" (ASTM C-31) and tested in accordance with "Method of Test for compressive Strength of

SECTION 03300
CAST-IN-PLACE CONCRETE

Molded Concrete Cylinders" (ASTM C-39). Each strength test result shall be the average of two cylinders from the same sample tested at seven (7), and twenty-eight (28) days.

- C. Strength tests of specimens cured under field conditions in accordance with ASTM C-31, "Methods of Making and Curing Concrete Compression and Flexure Test specimens in the Field" may be required by the Engineer to check the adequacy of curing and protection of the concrete in the structure. Such specimens shall be molded at the same time and from the same samples as the laboratory cured acceptance test specimens. Procedures for protecting and curing the concrete shall be improved when the strength of field-cured cylinders at the test age designated for measuring specified strength (f_{lc}) is less than 85 percent of that of the companion laboratory cured cylinders. When the laboratory cured cylinder strengths are appreciably higher than the specified strength (f_{lc}), the field cured cylinder strengths need not exceed f_{lc} by more than 500 psi even though the 85 percent criterion is not met.
- D. Compliance with the strength requirements of this division will be considered satisfactory when the following condition is satisfied:
 - 1. The averages of all sets of three consecutive strength test results equal or exceed the required specified strength (f_{lc}) and no individual strength test results falls below the required specified strength (f_{lc}) by more than 500 psi.
- E. Non-Compliance
 - 1. Should tests of laboratory-cured specimens produce strengths not in accordance with the requirements of this Specification, or tests of field-cured cylinders indicate deficiencies in protection and curing, steps shall be taken to assure that load carrying capacity of the structure is not jeopardized. If the likelihood of low-strength concrete is confirmed and computations indicate that the load-carrying capacity may have been significantly reduced, tests of cores drilled from the area in question may be required in accordance with "Standard Method of Obtaining and Testing Drilled Cores and Sawed Beams of Concrete" (ASTM C-42). Three cores shall be taken for each cylinder test more than 500 psi below specified strength (f_{lc}).

4.2 DEFECTIVE CONCRETE

- A. Defective concrete is defined as concrete in place which does not conform to strength, shapes, alignments, appearance, and/or elevations as shown on the drawings and/or which presents faulty surface areas.
- B. Concrete surfaces not finished in accordance with Paragraph 3.5 shall be classified as defective concrete.
- C. Concrete not cured in accordance with Paragraph 3.6 shall be classified as defective concrete.
- D. All defective concrete shall be removed and replaced in a manner meeting with the Engineer's approval, or should surface imperfections only occur, may be patched at the discretion of, and in a manner satisfactory to the Engineer. Permission to patch the work shall not be considered

SECTION 03300
CAST-IN-PLACE CONCRETE

as a waiver of the Owner's right to require complete removal and replacement of such defective work should the patching fail to satisfactorily restore the required quality and appearance of the work.

++END OF SECTION++